
V. ENVIRONMENTAL IMPACT ANALYSIS

E. HAZARDS AND HAZARDOUS MATERIALS

This section addresses existing and project related public health and safety issues, including safety issues associated with the adjacent Long Beach Municipal Airport (Airport). This section is based on the Report on Potential Hazards Related to the Long Beach Airport Operations prepared by Walter E. Gillfillan and Associates, the Environmental Assessment and Remediation Program Summary prepared by Haley & Aldrich, Inc., and a Phase I report prepared by Tetra Tech.^{132, 133, 134} These supporting documents are provided in Appendices J, K, and L, respectively, of this EIR.¹³⁵

1. ENVIRONMENTAL SETTING

a. Existing Conditions

In order to meet the aircraft production requirements of World War II, the United States of America War Assets Administration purchased the project site and adjacent properties in 1941 and began to construct an aircraft production facility, known as the Long Beach C-1 facility. Aircraft production has been ongoing on the C-1 site since its initial development. In fact, between the 1960s and early 1990s, the production of commercial aviation increased on the C-1 site. To date, the types of on-site operations associated with aircraft production have included office, research and development, manufacturing/processing, assembly/subassembly, material storage/warehousing, testing/laboratories, and ancillary aviation-related services. Although building demolition associated with the cooperative remediation program is currently underway, many of the buildings that still exist on the project site were constructed more than 50 years ago. Due to the types of historic and current uses at the C-1 site, and the age of the existing

¹³² *Report on Potential Hazards Related to the Long Beach Airport Operations prepared by Walter E. Gillfillan and Associates, October 2003.*

¹³³ *Boeing C-1 Long Beach Facility Phase I ESA Report, February 2000 and Environmental Assessment and Remediation Program Summary, Former C-1 Facility, January 2004.*

¹³⁴ *The Phase I report was prepared for the entire 363-acre C-1 Boeing site. The project site constitutes 261 acres of this site that are located west of Lakewood Boulevard.*

¹³⁵ *A portion of the Phase I report is provided in Appendix L. The Phase I in its entirety is on file with the Regional Water Quality Control Board.*

buildings, certain potential hazards have been identified that may affect the phased redevelopment of the project site, including asbestos, lead-based paint, underground storage tanks, seismic hazards, remediation of contaminated groundwater and soils, and hazardous material storage, use and transport. In addition, potential aviation related hazards are present in the area due to the proximity of the Airport. This section provides information relative to the existing potential safety hazards.

(1) Hazardous Materials

(a) Asbestos Containing Materials

Asbestos, which is made up of microscopic bundles of fibers, is a naturally occurring mineral. Asbestos has unique qualities, which include its strength, fire resistance, resistance to chemical corrosion, poor conduction of heat, noise, and electricity, and low cost. Asbestos has been widely used in the building industry for a variety of uses, including acoustic and thermal insulation and fireproofing. Asbestos is often found in ceiling and floor tiles, linoleum, and pipes, as well as on structural beams.

Despite its useful qualities, asbestos is associated with lung diseases caused by inhalation of airborne asbestos fibers. Asbestos becomes a hazard if the fibers separate and become airborne. Asbestos contained in existing building materials presents a risk to exposed employees and maintenance workers if the material is disturbed.

(b) Lead-Based Paint

Lead is a naturally occurring element and heavy metal that was widely used as a major ingredient in most interior and exterior oil-based paints prior to 1950. Lead compounds continued to be used as corrosion inhibitors, pigments, and drying agents from the early 1950s to 1972 when the Consumer Products Safety Commission specified limits on lead content in such products. Lead is known to have adverse effects on nearly every system in the human body. While adults can be affected by excessive exposure to lead, the primary concerns are the adverse health effects on children. The most common paths of lead exposure in humans are through ingestion and inhalation. Lead-based paint is of concern both as a source of exposure and as a major contributor to lead in interior dust and exterior soil. Nearly 50 percent of the buildings recently present on the project site were constructed prior to 1972 and, therefore, may contain lead-based paint.

(c) Underground Storage Tanks

In the past it was relatively common to store materials for industrial processes in underground storage tanks (USTs). Approximately 50 USTs have been located on the project site over the years. These USTs have been used to store solvents, jet fuel, unleaded gasoline, waste coolant, waste fuel, waste solvents, and sealant. All of the known USTs have been removed with the exception of two, which are inactive and are located within the portion of the project site that is located in the City of Long Beach and registered with the City of Long Beach. These two USTs were installed in 1989 and have a capacity of approximately 5,000 gallons each. They are double-walled and have active leak detection systems that have been certified by the Long Beach Fire Department. These tanks fully comply with applicable UST requirements including the stringent performance standards established to prevent UST releases and leaks. Currently, they are both empty and not in service. It is possible that other unknown USTs removed from service and closed in-place many years ago may be encountered in the ground during site demolition and grading activities. Should they be encountered, they will be managed and closed in accordance with applicable, current regulations. There are no USTs located on the portion of the project site located in the City of Lakewood.

(d) Handling, Storage, and Transport

As previously discussed, the project site has been used to manufacture aircraft since the 1940s. As such, there are a variety of associated hazardous materials that historically have been used on site and that continue to be used in manufacturing and related activities at the Boeing Enclave today. Currently, routine hazardous waste streams that are produced include paint sludge and filters, sealant tubes, primer cups and contaminated debris, toner and dry ink, batteries, oil and oil/water mixtures, and jet fuel. Demolition debris also includes some materials requiring disposal as hazardous wastes. Hazardous wastes are managed on-site in accordance with applicable local, State and Federal regulations designed to assure that all hazardous materials management activities are safe and protective of human health and safety, and the environment. For example, all drums containing hazardous materials must be properly labeled prior to being stored or transported. In addition, the Long Beach Division of Boeing currently has a labeling system that consists of an "inplant" label that meets all of the Federal and State requirements for the collection of hazardous wastes. Upon shipment for disposal, the "inplant" label is exchanged for a U.S. Environmental Protection Agency (EPA) label that is required for shipment to the disposal company. The drums are also labeled with California Department of Transportation (Caltrans) labels if required for shipment. The Long Beach Division of Boeing currently contracts with private hazardous waste haulers for the disposal of on-site hazardous waste.

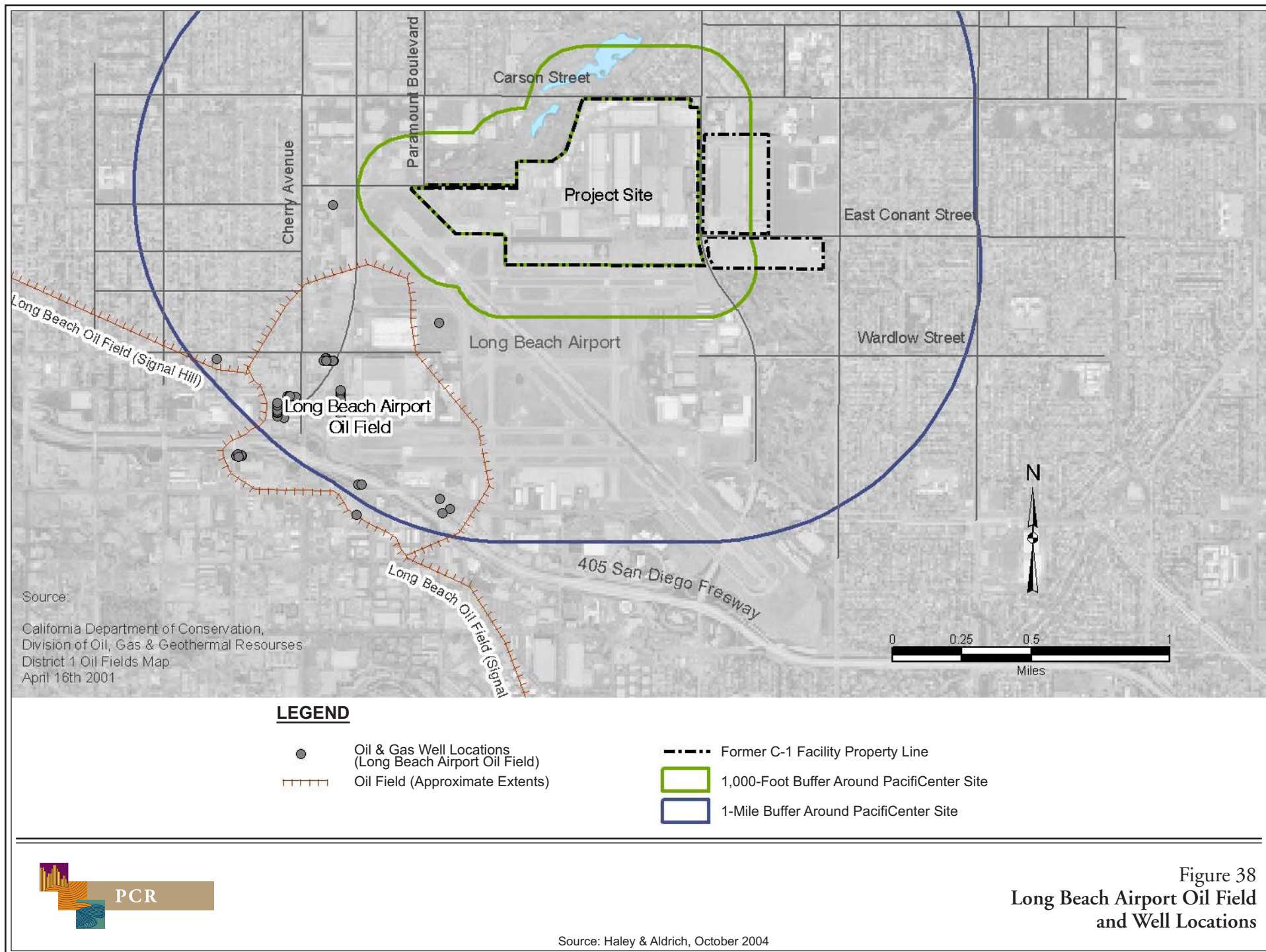
(e) Gas and Oil Wells

The project site is located in an area that has oil resources beneath the earth's surface. Two oil fields are located within the area surrounding the project site. According to State of California, Division of Oil, Gas, and Geothermal Resources' (DOGGR) records, oil wells were constructed in the area beginning in the mid 1950s. Based on oil and gas field maps and a historical database maintained by DOGGR, there are no active or abandoned oil/methane producing wells located on the project site.¹³⁶ In addition, the Phase I report indicates that, based on historical aerial photographs, there is no evidence of oil wells on the site. The closest oil fields to the site are the Long Beach Airport Oil Field and the Long Beach Oil Field, which are located approximately 0.2 mile and 0.9 mile, respectively, southwest of the project site.¹³⁷ The approximate boundary of the Long Beach Airport Oil Field is shown on Figure 38 on page 346. Within a one-mile radius of the C-1 Boeing facility there are approximately 50 active and abandoned oil wells, which are regulated by DOGGR. The oil wells are located to the southwest of the project site. The closest oil wells are located more than 0.3 mile from the project site's western boundary. Due to the distance of these wells from the project site, they do not pose a hazard to the site.

The potential for the presence of methane in the vicinity of the project site has been raised in public comments to the Notice of Preparation (NOP) for the proposed project. Naturally occurring methane emissions are often associated with oil fields in southern California, as methane and other gases can migrate upward through subsurface rock and soil. Methane can also be generated from many other sources including naturally occurring biological processes in the subsurface such as microbial activity, and its presence is common at varying concentrations in subsurface soil and groundwater. As discussed above, the project site is not located on the Long Beach Airport Oil Field. Rather, at its closest point, the Long Beach Airport Oil Field is located over 0.2 mile away. Therefore, the potential for migration of methane from the Long Beach Airport Oil Field to the project site in quantities sufficient to present a potential hazard at the site is considered minimal.

¹³⁶ California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, *District 1 Oil Fields Map*, April 16, 2001.

¹³⁷ *The Signal Hill Oil Field is also located in the general vicinity, although it is located farther from the project site than the Long Beach Airport Oil Field and the Long Beach Oil Field.*

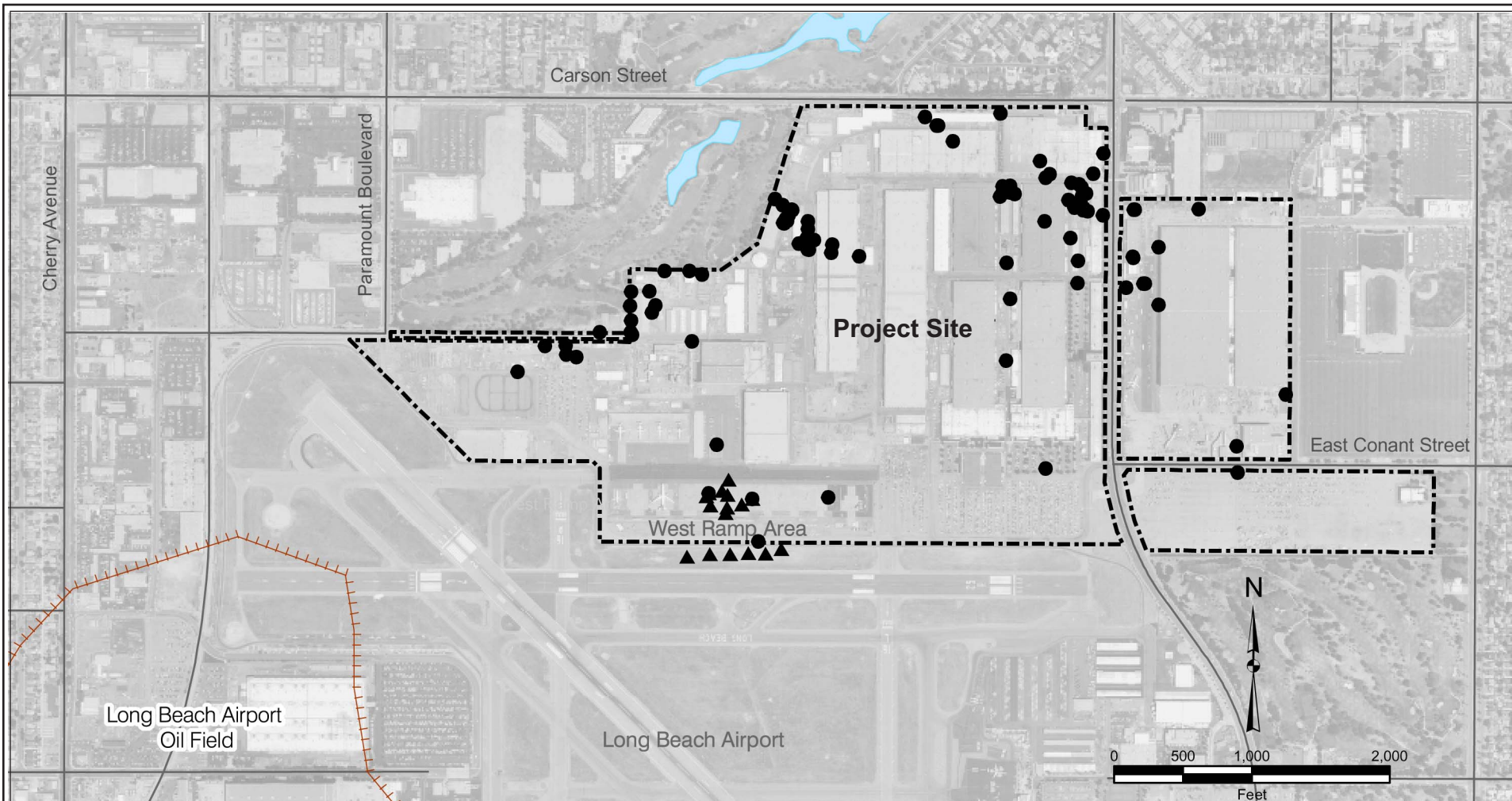


As part of the environmental remediation program underway within the project site, groundwater and soil vapor samples have been inspected, collected, and analyzed from the surface to depths of over 200 feet. Soil gas and groundwater samples from the borings and wells have been analyzed for a variety of chemical compounds, including methane gas. Laboratory analysis for methane was performed on 16 soil vapor samples collected from the “West Ramp” (southwest) area of the project site (as shown in Figure 39 on page 348.) at depths ranging from 20 to 60 feet below grade. The highest concentration of methane detected was 2,300 ppm, which is well below the common regulatory threshold, referred to as the Lower Explosive Limit (LEL) of 11,000 ppm.¹³⁸ The average concentration for all 16 samples was approximately 200 ppm. The source of this methane is thought to be from the naturally occurring microbial breakdown of organic chemical contamination present in areas of soil and groundwater beneath the project site. These concentrations are significantly below the lower explosive limit (LEL) and 20 percent of the LEL for methane and therefore do not present a potential methane combustion hazard on the project site.

Laboratory analysis for methane was performed on 120 groundwater samples collected across the project site, as shown in Figure 39. The highest concentration of methane detected in groundwater was 15 milligrams per liter (mg/l). The average methane concentration in groundwater was 0.65 mg/l. It is most likely that the methane detected in groundwater results from naturally occurring microbial breakdown of organic chemical contamination beneath the project site. By confirming the effectiveness natural degradation process for these organic chemicals, this methane occurrence is a favorable indicator for the success of the site’s groundwater remediation program and will help augment the overall site clean-up.

The Long Beach Airport Oil Field is not a significant or ongoing source of methane emissions beneath the project site. First, although there is no straightforward way to correlate between methane concentrations dissolved in groundwater and potential combustibility in air, widespread sampling of groundwater across the project site shows only relatively low methane concentrations in groundwater that are more consistent with organic chemical degradation from historic spills rather than naturally occurring methane from oil production areas. Second, methane gas concentrations of concern have not been

¹³⁸ For methane gas to be “explosive” it must be present at a concentration (in air) above its “lower explosive limit” (LEL). The LEL for methane gas in air is approximately 5.5 percent or 55,000 parts per million (ppm) in air. To provide an extra margin of protection, safety authorities typically use one-fifth or 20 percent of the LEL as an action level in evaluating the potential for gas combustion. The 20 percent LEL for methane is approximately 11,000 ppm.



LEGEND

- Methane Sample Locations - Groundwater
- ▲ Methane Sample Locations - Soil Vapor
- Oil Field (Approximate Boundary)
- Former C-1 Facility Property Line



Source: Haley & Aldrich, October 2004

Figure 39
Groundwater and
Soil Vapor Sample Locations
That Included Methane Sampling

detected in the shallow surface soils of the site; again, had the oil fields been a substantial source of methane, the gas would have risen to shallow soils or the surface provided that there are no significant barriers to upward migration.

(f) Electromagnetic Fields

Electric and magnetic fields (EMFs) are a basic force of nature, like gravity. EMFs are generated by electricity and are created in nature by such things as lightning and static electricity. Man-made EMFs are found where people use electricity. People are exposed to EMFs from many sources, including high voltage transmission lines carrying electricity from generating plants to communities, and distribution lines that bring electricity into a building. In addition, people are exposed to magnetic fields from wiring in buildings and from all electrical appliances, including TV sets, radios, hair dryers, electric blankets, and electrical tools.

An electric field emanates from electrical transmission lines while magnetic fields are the result of the electric currents flowing through the conductors. Field strength for both electric and magnetic fields falls dramatically with distance from the source. For both electric and magnetic fields, the strength decreases more quickly with distance from “point” sources like appliances than from “line” sources such as power lines. Electric fields can be shielded or weakened by trees, buildings, and even human skin but magnetic fields are not so easily blocked.¹³⁹ Research conducted over the last decade has raised much debate over the health effects associated with electric and magnetic fields. However, this research has produced no conclusive evidence of risk to human health.

At the Federal level, in 1992, the Energy Policy Act provided funding for a five-year program regarding EMF Research and Public Information Dissemination (EMF-RAPID). In 1999, the National Institute of Environmental Health Sciences (NIEHS) and National Institutes of Health released the report prepared in response to the Federal legislation. The report, entitled “Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields,” concludes, “In summary, the NIEHS believes that there is weak evidence for possible health effects from ELF-EMF¹⁴⁰ exposures, and until stronger evidence changes this opinion, inexpensive and safe reductions in exposure should be

¹³⁹ *Short Fact Sheet on EMF, California Electric and Magnetic Fields Program, California Department of Health Services and the Public Health Institute, 1999.*

¹⁴⁰ *ELF-EMF is extremely low frequency electric and magnetic fields.*

encouraged.”¹⁴¹ For example, the report states that “NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards.”¹⁴² The existing electrical facilities within the project area are described in Section V.M.4, Energy. Under existing conditions, two 66-kV lines located along Carson Street supply the Boost substation, located on a Boeing property immediately east of Lakewood Boulevard, which serves that property and the Boeing Enclave.¹⁴³ The two nearest generation plants are located adjacent to each other approximately 7.3 miles from the site and have separate transmission lines that follow opposite sides of the San Gabriel River Channel. The closest high voltage lines are approximately 2.8 miles from the PacifiCenter site. Although no conclusive evidence exists, based on the above information it is unlikely that these sources produce harmful EMFs within the project site due to their distance from the site.¹⁴⁴

(g) Remediation of Contaminated Soil and Groundwater

As indicated above, aircraft manufacturing, testing, and repair of commercial and military aircraft that has occurred on the project site for nearly 60 years, which involved the use of a wide range of chemical products including organic solvents, metal processing solutions, petroleum products, and electronic transformer oils. These broad categories of chemicals are considered the primary compounds/constituents that have been detected in soil and groundwater beneath the site.

Historical releases of some or all of these primary compounds/constituents have impacted soil and groundwater quality both on- and off-site. In 1995, the California Regional Water Quality Control Board—Los Angeles Region (LARWQCB) issued Cleanup and Abatement Order (CAO) No. 95-048 to McDonnell Douglas, Boeing’s predecessor. The CAO applies to the entire 343-acre C-1 facility.¹⁴⁵ The CAO was revised in December

¹⁴¹ NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields, Prepared in Response to the 1992 Energy Policy Act (PL 102-486, Section 2118), 1999, page 38.

¹⁴² Ibid.

¹⁴³ The 66-kV Carson Street lines previously supplied the Turbo and Stress substations, located on-site, which served the site in the past. As part of demolition activities presently occurring within the project site as part of the soil and groundwater remediation program, the Turbo and Stress substations are in the process of being removed.

¹⁴⁴ Ibid.

¹⁴⁵ As indicated above, the 261-acre project site is a part of the former C-1 facility. As the site is subject to a CAO by the SWRCB/RWQCB, the site falls within the list of hazardous sites within Section 65962.5 of the Government Code. However, the project site is not designated as a Border Zone Property pursuant to DTSC.

2000. In response to the original and amended CAO, Boeing has implemented a comprehensive environmental assessment and remediation program in coordination with LARWQCB. As these remediation efforts are underway and will occur regardless of whether redevelopment of the site occurs, the remediation program is not considered part of the PacifiCenter project. Rather, the remediation program is a related project for CEQA purposes. A summary of the ongoing remediation program is presented below; further and more detailed information about the program and site conditions is presented in Appendices J, K, and L. As discussed in more detail below, regulatory approval for “No Further Action” (NFA) and closure for soils in Environmental Investigation Areas (EIAs) that comprise a total land area of 204 acres (representing approximately 80 percent of the site) has been received from the LARWQCB.¹⁴⁶ Regulatory approval of NFA for the three remaining EIAs is expected shortly.

The primary compounds/constituents used on-site can be grouped into four broad categories: (1) organic solvents; (2) metal processing solutions; (3) petroleum products; and (4) electronic transformer oils.¹⁴⁷ The organic solvents are known as volatile organic compounds (VOCs), which tend to evaporate or volatilize at room temperature. Organic solvents were used for cleaning and degreasing aircraft parts, and included trichloroethylene (TCE), tetrachloroethylene (PCE), methylene chloride (MeCl), and 1,1,1-trichloroethane (TCA). Metal processing solutions are used in metal plating, anodizing, and etching processes, and can contain or form hexavalent chromium and other metals. The petroleum products include gasoline, diesel, jet fuel, petroleum distillates, oils, and greases. These fuels include VOCs such as benzene, ethylbenzene, toluene, and xylenes, and in more recent products, methyl tertiary butyl ether, a clean-air gasoline additive.¹⁴⁸ Gasoline and diesel were used to fuel vehicles and equipment at the facility. Petroleum distillates were used to clean various parts and equipment. Oils and greases were used as lubricants for equipment and machining processes. Older transformers may have contained oils formulated specially for electrical applications that contained polychlorinated biphenyls (PCBs).¹⁴⁹

Release of these primary compounds/constituents occurred on the C-1 site as spills and leaks from various equipment including, for example, storage tanks, vessels, buried

¹⁴⁶ *It should be noted that several smaller “carve-out” areas have been created in several of the closed EIAs. Further investigation and remediation will be conducted in these smaller areas contained within 5 EIAs until soil clean-up goals are reached. Upon completion of this work to the satisfaction of the LARWQCB, closure and NFA will be requested for soil in these remaining carve-out areas.*

¹⁴⁷ *Environmental Assessment and Remediation Program Summary, Former C-1 Facility, January 2004.*

¹⁴⁸ *Ibid.*

¹⁴⁹ *Ibid.*

pipings, chemical storage pads, wash down areas and painting booths.¹⁵⁰ When chemicals are spilled on the ground they migrate down through the soil under the forces of capillary tension and gravity. If and when the chemicals reach the groundwater they can:

- Partially dissolve and migrate in solution with the groundwater, which is known as “dissolved phase”;
- Float on top of the water table if they are lighter-than-water, such as jet fuel and gasoline, forming “light non aqueous phase liquids,” referred to as LNAPLs; or
- Sink below the water table if they are heavier-than-water, such as trichloroethylene, and form “dense non-aqueous phase liquids,” referred to as DNAPLs.

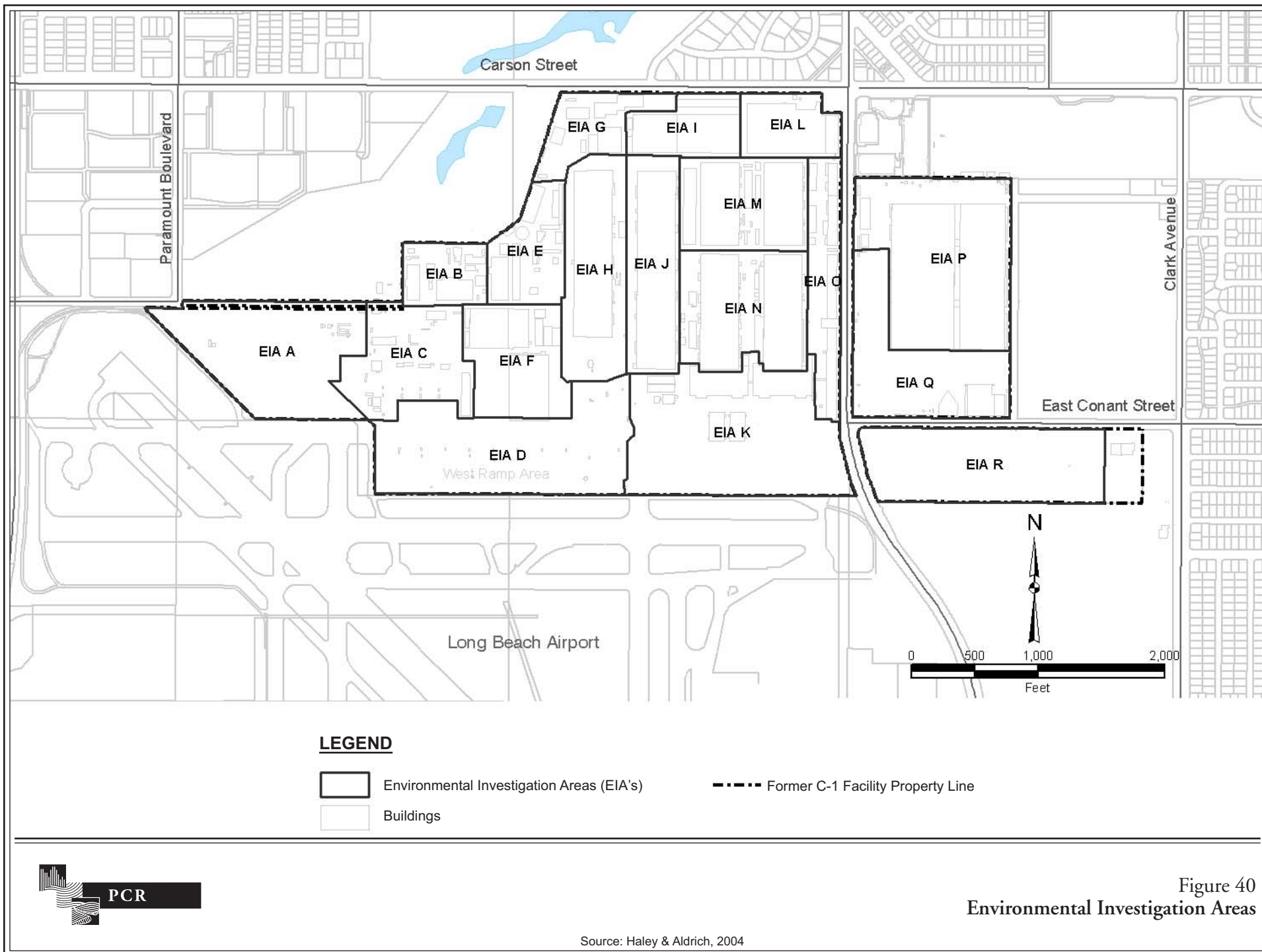
It is possible for these chemicals to move from their original point of release to affect surrounding soils and groundwater. The dissolved phase impacted areas are referred to as “plumes.”

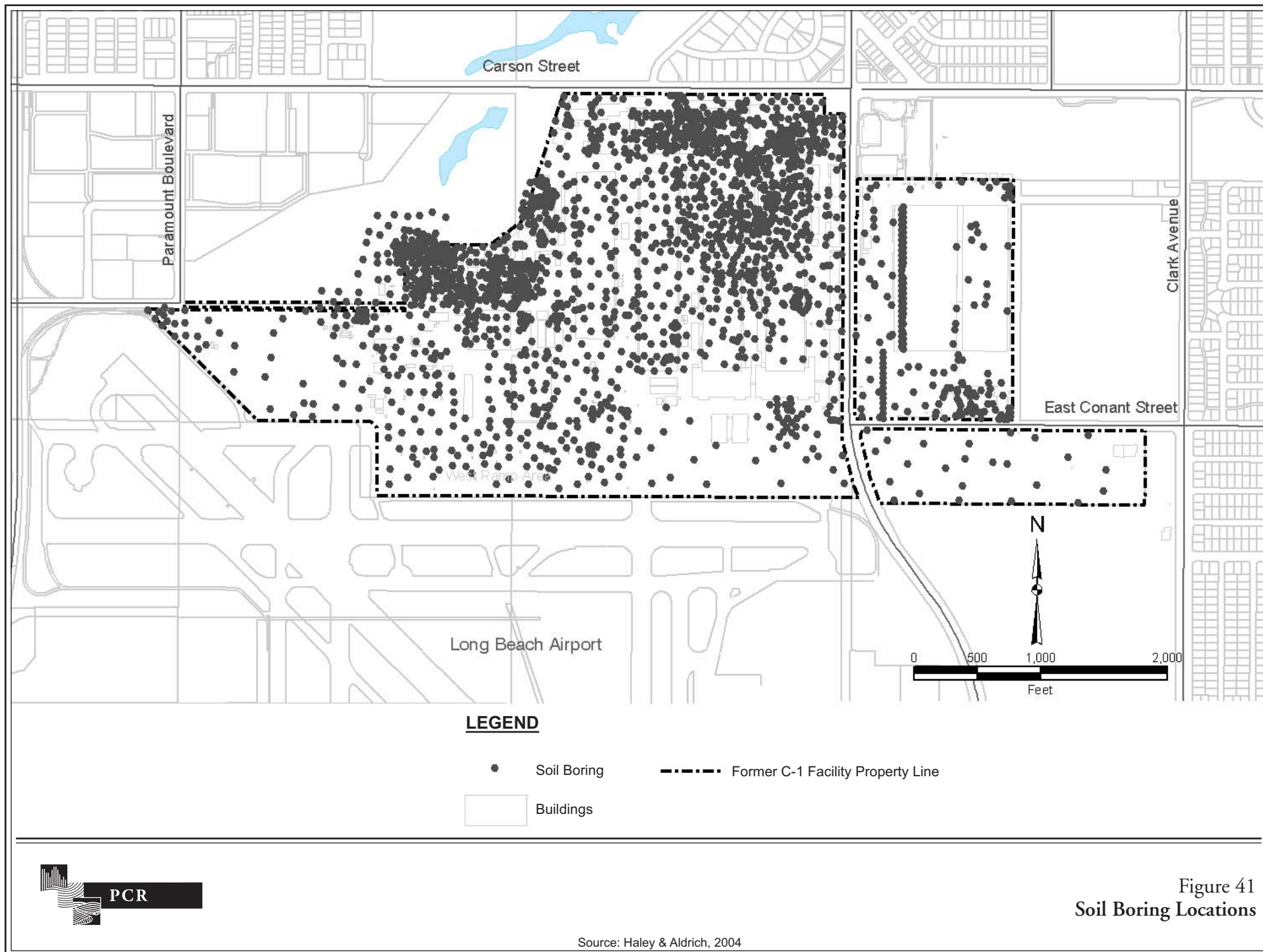
The presence of chemicals in plumes at the site prompted the comprehensive assessment and remediation program to be undertaken. Due to the size of the facility and the accelerated remediation schedule, the assessment program was separated into a soil assessment program and a groundwater assessment program that were undertaken simultaneously. In addition, the C-1 facility was divided into 18 separate EIAs, which are shown in Figure 40 on page 353. Fifteen of these EIAs are located within the project site boundaries.

Soil borings were conducted on site, the locations of which are provided in Figure 41 on page 354. The soils that extend from the surface to the first water table (approximately 30 to 40 feet below grade) tend to be well consolidated, fine grained sands and silts. Based upon the Phase II Soil Assessment sampling conducted, the following broad groupings of chemicals were most frequently detected at the site:

- Halogenated Volatile Organic Compounds (VOCs);
- Petroleum Hydrocarbons; and
- Hexavalent Chromium.

¹⁵⁰ *Ibid.*





The approximate locations of soil impacted by these chemicals are presented in Figure 7 of the Remediation Program Summary.

In addition to soil contamination, impacts to groundwater from chemical use on-site have occurred. A site-wide Groundwater Assessment and Monitoring (SWGA) program has been conducted on the project site. The results of the SWGA are being used to design the groundwater cleanup program. Figure 8 of the Remediation Program Summary (Appendix K of this EIR) shows the approximate location of the approximately 180 groundwater monitoring wells present at the site as of January 2004. Deeper sediments and groundwater have been investigated by drilling and sampling to depths of approximately 300 feet below grade as part of the SWGA.

As described in Section V.G, Water Quality, of this EIR, the shallow water bearing zones beneath the site include the Bellflower aquitard (divided into three hydrogeologic units: shallow, middle, and deep), the "Deeper Sand," the Artesia aquifer, the Gauge Aquitard, the Gage Aquifer, and the Deep Aquifer system.¹⁵¹ Groundwater flow direction in the Bellflower aquitards' three units as well as the Deeper Sand, are generally southerly. Groundwater flow directions in the Artesia and Gage aquifer's are generally to the east and northeast, but can vary seasonably.

As shown on Figure 15 of the Remediation Program Summary (Appendix K of this EIR), based on the SWGA results, the detection of VOCs (light blue areas) relating primarily to organic solvents indicates that the source of groundwater impact to the Bellflower aquitard appears to be located in the areas in or near Buildings 1, 2, 3, 5, 6, 10, 14, 36, and 85 and the WRA and Western Triangle areas. The detection of hexavalent chromium (green areas) indicates that the source of groundwater impact to the Bellflower aquitard appears to be located in Buildings 5, Building 6 north and the AQ. Petroleum hydrocarbons (dark blue areas) are found primarily in the WRA, in a small area to the east of Building 11 (Former Fueling Facility area), and west of Building 10. There is a dissolved phase petroleum hydrocarbon carbon plume around the fringe of jet fuel (LNAPL) floating on the water table at the WRA. Some of the VOC and jet fuel groundwater impacts have migrated offsite to the south and west of the property.

A deeper aquifer confirmation program was initiated in April 2001. This confirmation program included collection of groundwater samples on the southeast side of the facility from the Artesia Aquifer and on the southwest side of the facility from the Gage

¹⁵¹ *An aquitard is defined as sediment that is composed of fine grains (e.g., clays and silts). An aquifer is defined as sediment that is composed primarily of middle to coarse grains (e.g., sands and gravels).*

Aquifer. Analysis of groundwater samples collected in October 2001 did not detect the presence of TPH, hexavalent chromium, or levels of VOCs above their respective drinking water Maximum Contaminant Levels (MCLs). This would indicate that groundwater impacts are confined to the more shallow water bearing zones beneath the site from which no nearby groundwater supply is drawn (Hargis 2002a). More recent results from groundwater sampling in October 2003 confirm that this situation remains unchanged.

As part of the assessment and remediation program, a human health risk assessment (HHRA) procedure, reviewed and approved by the Office of Environmental Health Hazard Assessment (OEHHA) and LARWQCB, will be used to assess when areas have been remediated to levels that present no significant human health risks for future commercial, light industrial, and residential uses. A Risk Assessment Workplan (RAWP), which outlines the processes, calculations, and supporting data that will be used to conduct the HHRAs was prepared for the site. The RAWP was reviewed by OEHHA and the California Regional Water Quality Control Board and approved on October 1, 2002. Human health risk assessments for the property will: (1) identify Compounds of Potential Concern (COPCs); (2) identify potential routes of exposure and potential receptors of such exposure; (3) estimate the carcinogenic and non-carcinogenic risks for each receptor; and (4) compare the calculated levels of risk to the maximum allowable risk level for the site. Receptors that will be evaluated in the HHRAs include: (1) receptors during cleanup activities including the on-site construction workers and off-site workers and residents; and (2) receptors after redevelopment of the property including on-site workers, on-site residents (child and adult, including day care centers), on-site gardeners, and off-site employees and residents.

Remediation efforts are overseen by LARWQCB and have either been completed, are underway, or are in advanced preparatory stages in 14 areas of the site. The status of soil and groundwater remediation in the 14 areas is summarized in Section 3.4 of the Environmental Assessment and Remediation Program Summary provided in Appendix K. In addition, as indicated above, of the 15 EIAs that comprise the site, regulatory approval for "No Further Action" (NFA) and closure for soils in 12 of the EIAs has been received from the Los Angeles Regional Water Quality Control Board (LARWQCB). These EIAs comprise a total land area of 204 acres, representing approximately 80 percent of the site.¹⁵² Regulatory approval of NFA for the 3 remaining EIAs is expected shortly. The LARWQCB is reviewing and confirming continued assessment and remediation work that

¹⁵² *It should be noted that several smaller "carve-out" areas have been created in several of the closed EIAs. Further investigation and remediation will be conducted in these smaller areas contained within 5 EIAs until soil clean-up goals are reached. Upon completion of this work to the satisfaction of the LARWQCB, closure and NFA will be requested for soil in these remaining carve-out areas.*

is being conducted during demolition in these and the remaining EIAs as the work progresses.

There are various types of remedial technologies for soil and groundwater that can be implemented either independently of each other or in combination based on the type of impact. Based on Phase II soil assessments conducted on the project site, the following four technologies may be suitable for shallow soil (approximately 0 to 12 feet below grade) remediation program: (1) engineered vapor/infiltration migration barriers; (2) excavation with off-site and/or ex-situ treatment; (3) soil vapor extraction; and (4) in situ remediation.¹⁵³ With regard to groundwater, the remediation program addresses cleanup of groundwater in two subcategories: (1) source areas, including the deeper soils (greater than 12 feet in depth) that can impact groundwater quality, as well as LNAPL and/or high concentrations of primary compounds/constituents in the groundwater source areas; or (2) dissolved phase plumes, including primary compounds/constituents dissolved in groundwater down gradient of the groundwater source areas.¹⁵⁴ Based on the results of groundwater assessment and on-site pilot testing, the following six technologies are appropriate for source area or dissolved phased plume groundwater remediation: (1) dual-phase extraction; (2) in situ chemical treatment; (3) in situ chemical reduction; (4) hydraulic containment using pump and treat technology; (5) enhanced in-situ bioremediation using naturally occurring and/or bioaugmented microorganisms present in the subsurface; and (6) monitored natural attenuation. Please refer to the Environmental Assessment and Remediation Program Summary contained in Appendix K for a detailed discussion regarding these remediation technologies.

The Assessment Confirmation and Expedited Remediation (ACER) program is a component of the comprehensive environmental assessment and remediation program. The ACER program will implement additional monitoring and sampling of shallow soils during the removal of pavement and subsurface structures at the site. Through the implementation of the ACER, areas of contamination may be identified. If areas of contamination are identified, the areas will be remediated in accordance with the specifications identified in the LARWQCB ACER work plan.

The northeast corner of the project site, which is currently not under Boeing ownership, was previously used as a gas station. A two-story ranch house was located on the parcel sometime after 1935. By 1947, a service station was constructed and

¹⁵³ *Ibid.*

¹⁵⁴ *Ibid.*

continued operating until nearly two years ago.¹⁵⁵ The City of Long Beach has acquired the gas station property and a portion of the property will be used for transportation improvements at the corner of Carson Street and Lakewood Boulevard. The previous owner, under agreement with the City, will remediate any contamination on the property and will remain responsible for long-term remediation. As with other remediation efforts, any contamination will be remediated to levels that present no significant human health risk for future uses, in accordance with the appropriate regulatory agency.

(2) Airport Safety

As discussed in Section III, Project Description, of this EIR, the project site is located to the north of the Long Beach Municipal Airport (Airport). As with any development in close proximity to a commercial service airport, the potential exists for the creation of safety hazards. Airport safety hazards are typically associated with building heights as well as the proximity of development to runways. A brief description of the Airport is provided below.

The Long Beach Airport, which comprises approximately 1,166 acres, is designated as a non-hub airport (i.e., serving less than 0.05 percent of the total nation-wide enplanements) with 350,603 operations (landings and takeoffs) in 2002. The airport serves a large number of private non-commercial aircraft and is one of the nation's busiest airports in terms of general aviation activity, in which 93 percent of the annual operations are general aviation.^{156, 157} The remaining seven percent of the operations are as follows: five percent of the operations is by air carrier, two percent is by commuter carrier, and less than one percent is by industrial.^{158, 159} In 2002, the airport handled approximately 58,600 tons of air cargo. In addition, between August 2001 and 2003, the number of passengers has increased from 600,000 annual passengers to almost 3,000,000 annual passengers. The Airport includes scheduled flights operated by America West, American,

¹⁵⁵ Tetra Tech, Inc., *Boeing C-1 Long Beach Facility, Phase I ESA Report*, February 2000.

¹⁵⁶ *Long Beach Airport, LGB Monthly Airport Activity Report*, December 2002.

¹⁵⁷ *General aviation is defined as activity other than operation by air carrier, commuter carrier, industrial operations, charter operations, and public aircraft (i.e., private non-commercial aircraft).*

¹⁵⁸ *Long Beach Airport, LGB Monthly Airport Activity Report*, December 2002.

¹⁵⁹ *Air carrier is defined as a scheduled carrier operating aircraft having a certified maximum takeoff weight of 75,000 pounds or more, transporting passengers or cargo. Commuter carrier is defined as a scheduled carrier operating aircraft having a certified maximum takeoff weight of less than 75,000 pounds, transporting passengers or cargo. Industrial operation refers to aircraft over 75,000 pounds for purposes of production, testing, remanufacturing, or delivery by or under the control of a manufacturer based at the Long Beach Airport.*

Airborne Express, Federal Express, Horizon, Jet Blue Airways, and United Parcel Service.¹⁶⁰

As discussed in more detail in Section V.I, Noise, the Airport has five runways, ranging in total length from 4,267 feet to 10,000 feet.¹⁶¹ (Refer to Table 21 on page 360, for characteristics of each runway). There are two sets of parallel runways aligned in an east-west (7L/25R and 7R/25L) and north-south (16L/34R and 16R/34L) direction forming a rectangle, and an additional 10,000-foot-long runway (Number 12/30) that is aligned in a northwest-southeast direction splitting the two sets of runways. All of the runways are used for general aviation. Runway 12/30 is used for commercial flights as well as general aviation. In addition, Runway 12/30 is the only runway that is active between the hours of 10:00 P.M. to 7:00 A.M.¹⁶² Runway 7L/25R is used as the back-up runway for commercial flights, but is typically used for such flights only during rare circumstances (e.g., during repaving of Runway 12/30).

Based on general aviation flight track data provided by the City of Long Beach Airport Bureau, the predominant east-west (7L/25R and 7R/25L) runway flight pattern results in over flights north of Carson Street. The north/south (16L/34R and 16R/34L) runway flight pattern is not used as often as the east/west flight pattern, but would result in general aviation overflights across the project site.¹⁶³ As indicated by Table 21, based on recent data from the Airport, runways 16L and 16R are each typically used approximately 7 and 0.5 percent of the time, respectively, and runways 34R and 34L are each used 0.5 percent of the time.

With regard to aircraft accidents from aircraft using the Airport, the National Transportation Safety Board (NTSB) records indicate that there were 119 incidents (with no fatalities or injuries) that occurred within an approximate 21-year timeframe from July 1981 to December 2002.^{164, 165} In addition 56 accidents (with seven fatalities, three serious

¹⁶⁰ Long Beach Airport, LGB Monthly Airport Activity Report, August 2003.

¹⁶¹ Measured end to end of pavement. There is a short piece of pavement at the south and north ends of Runway 16/34 that is not counted as pavement or as a stopway probably because of an east-west taxiway at the end.

¹⁶² Except in case of emergency or air traffic direction, all aircraft Operations between the hours of 10:00 P.M. and 7:00 A.M. are limited to runways 30 and 12. In addition, all airline operations must be scheduled between 7 A.M. and 10 P.M. Airline operations between 10 P.M. and 11 P.M. are allowed if the delays are caused by weather, air traffic, or mechanical issues.

¹⁶³ The north-south runway configuration is used less frequently due to the short runway length, limitation for only visual operations, and curfew after 10:00 P.M.

¹⁶⁴ National Transportation Safety Board database, www.nts.gov, accessed December 2003.

Table 21

LONG BEACH MUNICIPAL AIRPORT RUNWAY CHARACTERISTICS

Orientation	Runway Number	Runway Usage (%)	Length (feet)	Width (feet)	Use
East-West	7R/25L	7R (2.5%) 25L (25.0%)	5,420	150	General Aviation
East-West	7L/25R	7L (2.5%) 25R (25.0%)	6,192	150	General Aviation and airline alternate for Runway 12/30
North-South	16R/34L	16R (7.0%) 34L (0.5%)	4,470	75	General Aviation
North-South	16L/34R	16L (7.0%) 34R (0.5%)	4,267	75	General Aviation
Northwest-Southeast	12/30	12 (6.0%) 30 (24.0%)	10,000	200	General Aviation and Commercial

Source: www.airnav.com/airport/KLGB, 2003 and US Department of Transportation, FAA, personal correspondence, November 24, 2003.

injuries and six minor injuries) occurred during this same period.¹⁶⁶ Forty-five of these accidents occurred on the airport property and the remaining eleven accidents occurred off the airport property. Based on the NTSB data, none of the accidents occurred within the PacifiCenter site. In addition, based on information from the Airport, none of the fatalities occurred within the Airport property.

The Airport has prepared an Airport Layout Plan, which illustrates, among other things, the airport property boundaries, airport facilities, runways, taxiways, helipads, adjacent land uses, buildings on the airport property, building restriction lines, and runway protection zones (RPZs). This Airport Layout Plan has most recently been reviewed and approved by the FAA on April 5, 2000 and revalidated by the FAA on September 5, 2002.

Components illustrated on the Airport Layout Plan that affect the PacifiCenter development include four (4) RPZs and a "Building Restriction Line." These components

¹⁶⁵ An incident is defined by the NTSB as an occurrence other than an accident associated with the operation of an aircraft which affects or could affect the safety of operations.

¹⁶⁶ The NTSB defines an aircraft "accident" as an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

are illustrated in Figure 42 on page 362. The RPZ at the end of Runway 12 extends partially onto the very western portion of the PacifiCenter site that is located within the City of Lakewood. In addition, the majority of the RPZ at the end of Runway 16R is located within the southwestern portion of the site. The Runway 16L RPZ is located in the south-central portion of the PacifiCenter site. Finally, a very small portion of the Runway 25R RPZ is located at the very southeastern portion of the project site and is contained within the Building Restriction Line.

As discussed in detail below, the project site is also located within portions of the six safety compatibility zones as identified in Caltrans' California Land Use Planning Handbook. This Handbook provides compatibility planning guidance and does not constitute formal state policy or regulation. The zones in which the project is located include the Runway Protection Zone, Inner Safety Zone, Inner Turning Zone, Outer Safety Zone, Sideline Safety Zone, and Traffic Pattern Zone.

b. Regulatory Framework

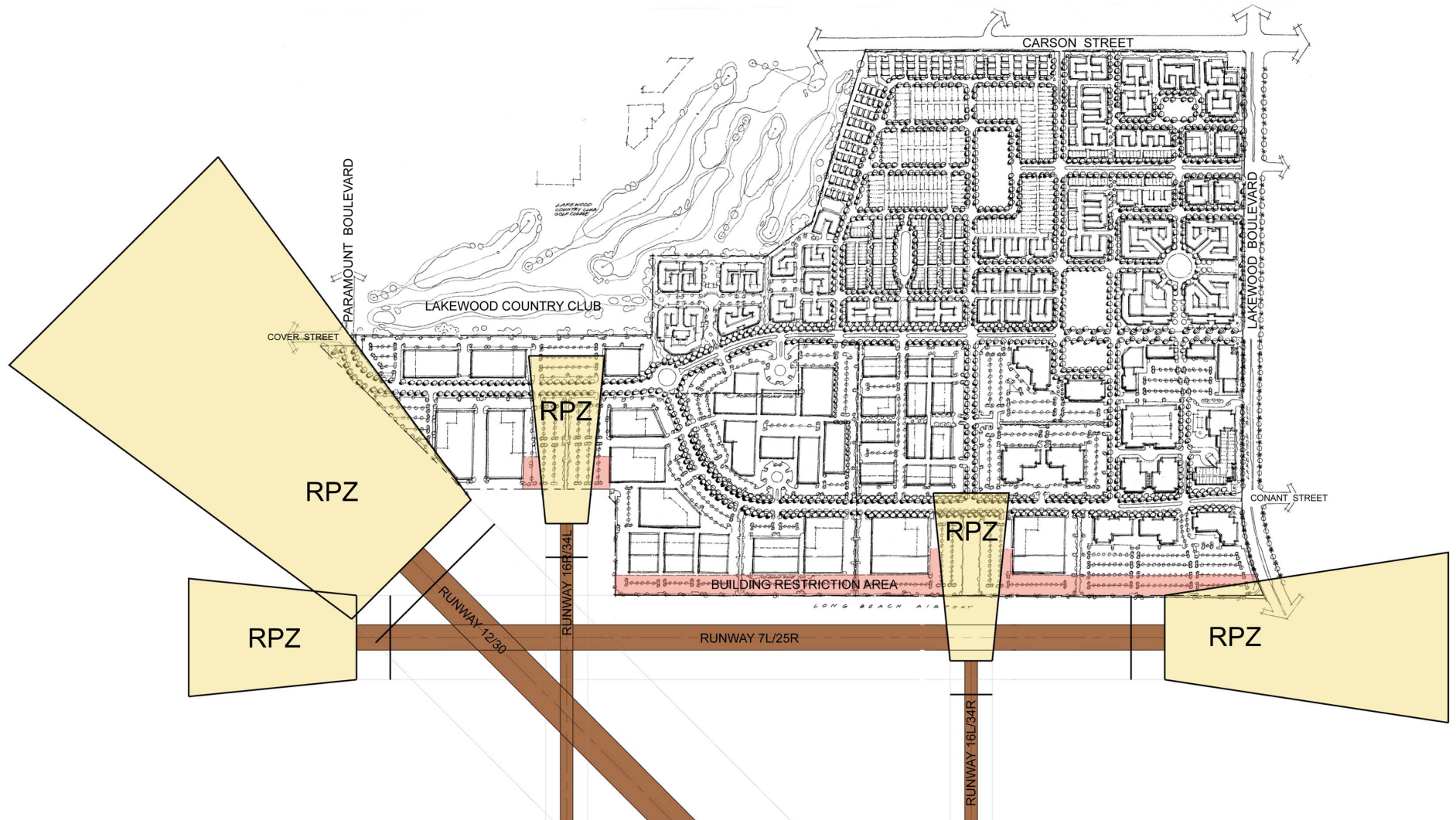
(1) Hazardous Materials

(a) Asbestos Containing Materials

In California, any facility that is known to contain asbestos is required to have a written asbestos management plan and removal of asbestos containing materials must be conducted in accordance with the requirements of the South Coast Air Quality Management District (SCAQMD) Rule 1403. Rule 1403 regulations require: (1) a survey of the facility prior to issuance of a permit by SCAQMD; (2) notification of the SCAQMD prior to construction activity; (3) removal in accordance with prescribed procedures; (4) placement of collected asbestos in leak-tight containers or wrapping; and (5) proper disposal.

(b) Lead-Based Paint

The California Occupational Safety and Health Administration (OSHA) has established limits of exposure to lead contained in dusts and fumes. Specifically, California Code of Regulations (CCR) Title 8, Section 1532.1 provides for exposure limits, exposure monitoring, and respiratory protection, and mandates good working practices by workers exposed to lead.



(c) Underground Storage Tanks

The storage of hazardous materials in underground storage tanks is regulated by the State of California Water Resources Control Board (SWRCB), which has delegated authority to the Regional Water Quality Control Board (RWQCB) and typically on the local level to the Fire Department. The Long Beach Fire Department regulates underground storage tanks on the project site. USTs used for unleaded gasoline are also subject to South Coast Air Quality Management District (SCAQMD) Rule 461 "Gasoline Transfer and Dispensing."

(d) Handling, Storage, and Transport

The handling and storage of hazardous materials on the project site are subject to a variety of Federal, State, and local regulations. At the local level, Long Beach Fire Department inspectors monitor the storage of hazardous materials for compliance with the local requirements. Within the City of Lakewood, the County of Los Angeles Fire Department monitors such activities. Businesses which store more than threshold quantities of hazardous materials as defined in Chapter 6.95 of the California Health and Safety Code are required to file an Accidental Risk Prevention Program with the appropriate fire department, which contains information such as emergency contacts, phone numbers, facility information, chemical inventory, and hazardous materials handling and storage locations. In addition, employees and employees of contractors that handle hazardous wastes, or are potentially exposed to hazardous wastes, are required under Federal Occupational Safety and Health Administration (OSHA) (29 C.F.R. § 1910.120) and California OSHA regulations to be trained and certified to handle hazardous waste and materials.

(e) Gas and Oil Wells

As discussed above, active and abandoned oil wells in the vicinity of the proposed project are regulated by the State of California, Division of Oil, Gas, and Geothermal Resources (DOGGR).

(f) Electromagnetic Fields

Electro-magnetic fields, or EMFs, are regulated by the Federal Communications Commission (FCC). In 1996, the FCC adopted new guidelines and procedures for

evaluating environmental effects of radiofrequency emissions, which encompass the OSHA guidance on radiofrequency emissions.¹⁶⁷

(2) Airport Safety

Development in close proximity to an airport must comply with all relevant Federal, State, and local safety regulations to ensure that no potential hazards are created. These regulations and guidelines address the safety of aircraft in flight as well as the safety of people on the ground. Any development of land in the immediate vicinity of the Airport must be compatible with airport operations. The primary safety concerns are associated with the construction of buildings or other structures that exceed height restrictions or that are located in an RPZ, since such buildings or structures may present a hazard to aircraft operations.¹⁶⁸

In this regard, FAR Part 77, Objects Affecting Navigable Airspace, establishes minimum standards to ensure air safety by regulating the construction or alteration of buildings or structures that may affect airport operations.¹⁶⁹ The FAA requires that Form 7460-1, Notice of Proposed Construction or Alteration, be filed with the FAA regional office prior to construction or alteration of an object that may interfere with the navigable airspace. Additionally, since Part 77 represents minimum height standards, States and local governments often develop additional secondary guidelines unrelated to height restrictions to increase the level of safety associated with a particular development. State and local governments tend to address secondary safety concerns, such as bird strikes and lights that may be indistinguishable from airport lighting or that may interfere with pilots' vision.

In addition, there are instances when the owner of a public airport may permit access to the public landing area by independent operators offering an aeronautical activity or by aircraft based on land adjacent to, but not a part of, the airport property. This type of arrangement is commonly called a "through-the-fence" operation. Through-the-fence operations include businesses or individuals that have access to the airport infrastructure from outside airport property, or that utilize airport property to conduct a business but do not rent business space at the airport. More common types of through-

¹⁶⁷ *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*, OET Bulletin 65, Edition 97-01, August 1997, Federal Communications Commission Office of Engineering and Technology.

¹⁶⁸ See FAA Advisory Circular 150/5300-13 (Sept. 30, 2000).

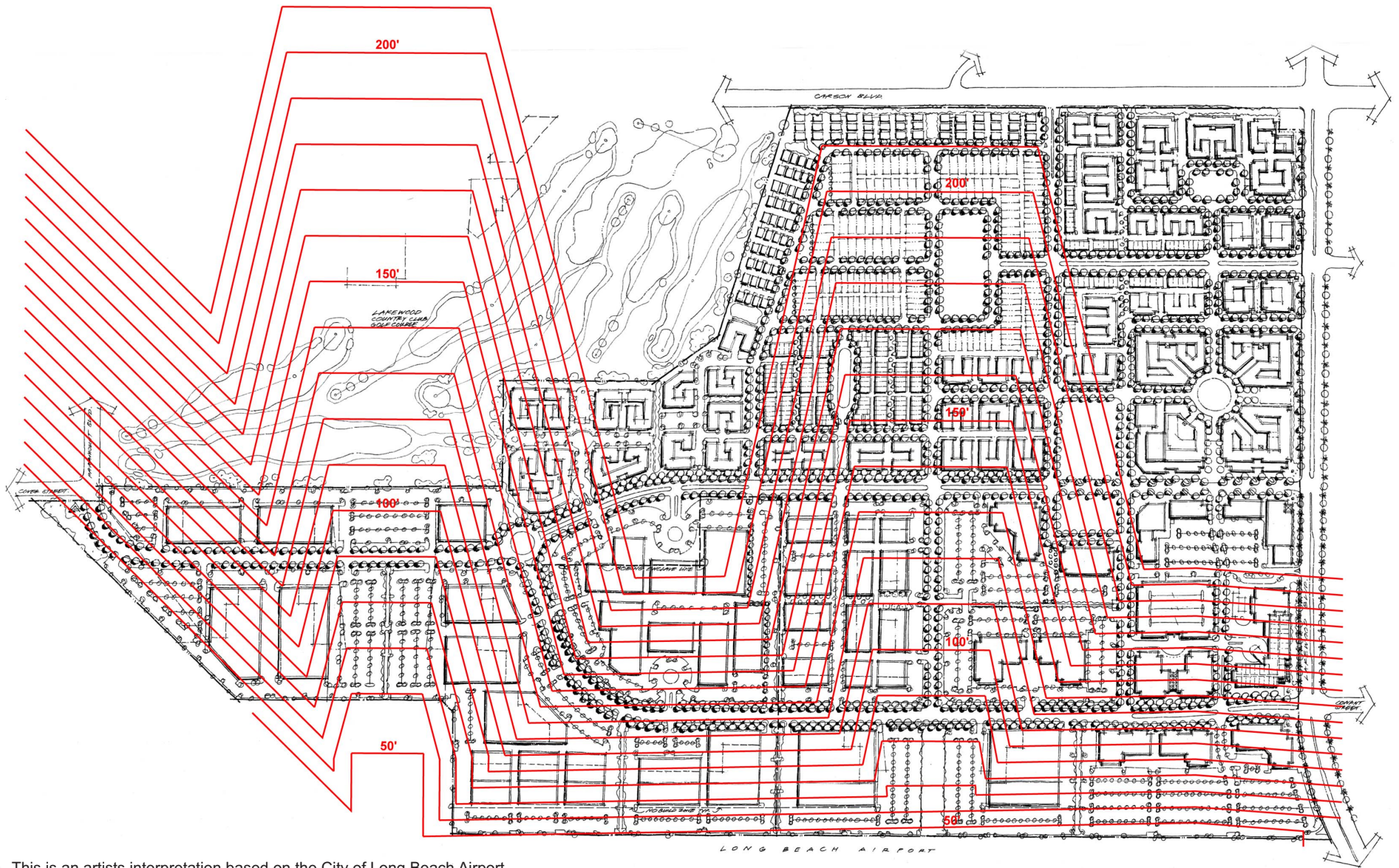
¹⁶⁹ 14 C.F.R. Part 77 (2001).

the-fence agreements are for freelance flight instruction, aircraft maintenance, and aircraft hangars. Such through-the-fence agreements between an airport proprietor and a through-the fence operator are typically reviewed and approved by the Airport with Airport consultation with the FAA.

The Los Angeles County Regional Planning Commission is the designated Airport Land Use Commission (ALUC) for airports within Los Angeles County in accordance with Title 21 of the California Public Utilities Code. The Regional Planning Commission has the responsibility for coordinating the airport planning of public agencies within the County. The primary goal of the ALUC is to protect the public health, safety, and welfare by ensuring orderly expansion of airports and development of lands in the vicinity of airports through the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public use airports. The ALUC achieves this goal through the publication of the Los Angeles County Comprehensive Airport Land Use Plan (ALUP) and other guidance. The ALUP has been based on guidelines, recommendations, regulations and/or policies of the FAA, Caltrans—Division of Aeronautics, and municipalities from within the County. The ALUP provides for the orderly expansion of the area surrounding the Airport. It is also intended to provide for the adoption of land use measures that will minimize the public's exposure to excessive noise and safety hazards. The ALUC has established provisions for safety, noise, and building heights within areas adjacent to the airport.¹⁷⁰ With regard to safety, the ALUP includes the observance of the RPZs discussed above, in the City of Long Beach Airport Layout Plan. The ALUP also establishes standards for determining whether obstructions cause substantial adverse effect on air navigation. Specifically, the County of Los Angeles ALUP has adopted the FAR Part 77 criteria, which place restrictions on the height and mass of structures at specified distances from the airport runways. As such, these FAR Part 77 height restrictions have been used in the Long Beach Airport Runway Approach Zones Standards for Determining Obstructions to Air Navigation, which is used with regard to development on and adjacent to the Airport. These restrictions are illustrated in Figure 43 on page 366.

The ALUP provides policies to promote land use compatibility and limit noise and other safety conflicts in areas surrounding airports. The ALUP also sets forth seven safety policies to assist a sponsor in its development of a project in close proximity to an airport. These policies include:

¹⁷⁰ Refer to Section V.I, Noise, of this Draft EIR for an analysis of aviation-related noise.



This is an artists interpretation based on the City of Long Beach Airport
 "Runway Approach Zones Standards for determining obstructions to Air Navigation -
 As per part 77 of the FAR" (Drawing No. D-416G)



Scale Not Provided

Source: MVE Architects, October 2003

Figure 43
 Illustration of FAA Height Contours
 and Section Key Plan

- **S-1.** Establish “runway protection zones” contiguous to the ends of each runway. These runway protection zones shall be identical to the FAA’s runway protection zones (called clear zones).
- **S-2.** Prohibit above ground storage of more than 100 gallons of flammable liquids or toxic materials on any one net acre in a designated RPZ. It is recommended that these materials be stored underground.
- **S-3.** Prohibit, within a RPZ, any use that would direct a steady or flashing light of red, white, green, or amber colors associated with airport operations toward aircraft engaged in an initial straight forward climb following take-off or toward an aircraft engaged in a final approach toward landing at an airport.
- **S-4.** Prohibit, within a designated RPZ, the erection or growth of objects that rise above an approach surface unless supported by evidence that it does not create a safety hazard and is approved by the FAA.
- **S-5.** Prohibit uses that would attract large concentrations of birds, emit smoke, or which may otherwise affect safe air navigation.
- **S-6.** Prohibit uses that would generate electrical interference that may be detrimental to the operation of aircraft and/or aircraft instrumentation.
- **S-7.** Comply with the height restriction standards and procedures set forth in FAR Part 77.

Caltrans Division of Aeronautics is responsible for funding, licensing, and permitting programs for airports and helicopters in California. The Caltrans *Airport Land Use Planning Handbook* (hereafter referred to as the Caltrans Handbook) provides compatibility planning guidance to airport land use commissions, their staff and consultants, the counties and cities having jurisdiction over airport area land uses, and airport proprietors. Since neither the FAA nor the County provides specific guidelines for land use compatibility assessments with respect to the safety of people on the ground beyond the establishment of Runway Protection Zones, the guidelines presented in the Caltrans Handbook are generally considered a “starting point” for a local determination process. The Caltrans Handbook does not constitute formal state policy or regulation but rather, is intended to provide basic guidance in establishing noise and safety compatibility criteria. The recommended guidelines address various safety concerns (e.g., bird strikes, light, and glare) and include the establishment of various land use compatibility zones to assist decision-makers in assessing areas of increased hazards based on the flight paths of aircraft.

An understanding of the overall premises used by Caltrans in developing their land use compatibility guidelines for safety is important. Using National Transportation Safety Board statistics for aircraft accidents, the probability of an accident occurring, location of accident sites and the risks and consequences to people in the aircraft and on the ground were identified. Data for a twenty-year record of aircraft accidents, nation-wide was investigated. Of particular interest, were those accidents involving people and structures on the ground. The focus is on the risk exposure for various land uses derived from this accident data. Some of the elements are summarized as follows:

- **Probability**—Probability of an aircraft accident occurring is very low. The probability of an aircraft accident that involves people and structures on the ground is extremely low - however, it is not zero.
- **Location**—Most accident sites occur within the confines of the airport. Off-airport accident sites are concentrated near the runway ends and extended runway centerlines for both arriving and departing aircraft.
- **Risk Exposure**—The evaluation of risk and land use compatibility is relatively easy in the higher exposure areas near the runway ends. Further out from the runway ends, judgment is applied that considers the types of aircraft involved, night operations, instrument operations, flight training, etc. Included in this determination is the consideration of the relative risk exposure inherent in all other public health, safety and welfare decisions that range from traffic signals, to fire hazards, hand railings and employee safety. Safety is a term that is judged by the level of risk that is acceptable in conducting the public's business and activities.
- **Consequences**—This is an important element in considering acceptable risk to the public and includes the likely property damage, injuries and fatalities that could occur should an accident happen. It is in this element that differences appear when considering various land uses. The risk for schools offers a different level of consideration than for industrial plants. As a matter of public policy, more stringent criteria are generally applied when considering the safety of children in a school environment. Similar differences are apparent in the Caltrans land use criteria between residential and office land uses. These differences are reflected in, not only the recommendation of acceptability, but also in the suggested land coverage and human occupancy factors.

The compatibility zones established by Caltrans and a qualitative description of the land use characteristics that are considered acceptable or unacceptable within each of the zones is provided below. As discussed in Appendix J, these zones are not precise lines and descriptions that delineate “safe or unsafe” conditions.

- Zone 1: Runway Protection Zone
 - Airport ownership of property encouraged
 - Prohibit all new structures
 - Prohibit residential land uses
 - Avoid nonresidential uses except if very low intensity in character and confined to the sides and outer end of the area
- Zone 2: Inner Approach/Departure Zone
 - Prohibit residential uses except on large, agricultural parcels
 - Limit nonresidential uses to activities which attract few people (uses such as shopping centers, most eating establishments, theaters, meeting halls, multi-story office buildings, and labor-intensive manufacturing plants unacceptable)
 - Prohibit children’s schools, day care centers, hospitals, nursing homes
 - Prohibit hazardous uses (e.g., aboveground bulk fuel storage).
- Zone 3: Inner Turning Zone
 - Limit residential uses to very low densities (if not deemed unacceptable because of noise)
 - Avoid nonresidential uses having moderate or higher usage intensities (e.g., major shopping centers, fast food restaurants, theaters, meeting halls, buildings with more than three aboveground habitable floors are generally unacceptable)
 - Prohibit children’s schools, large day care centers, hospitals, and nursing homes
 - Avoid hazardous uses (e.g., aboveground bulk fuel storage)

- Zone 4: Outer Approach/Departure Zone
 - In undeveloped areas, limit residential uses to very low densities (if not deemed unacceptable because of noise); if alternative uses are impractical, allow higher densities as infill in urban areas;
 - Limit nonresidential uses as in Zone 3
 - Prohibit children's schools, large day care centers, hospitals, and nursing homes
- Zone 5: Sideline Zone
 - Avoid residential uses unless airport related (noise usually also a factor)
 - Allow all common aviation-related activities provided that height-limit criteria are met
 - Limit other nonresidential uses similar to Zone 3, but with slightly higher usage intensities
 - Prohibit children's schools, large day care centers, hospitals, and nursing homes
- Zone 6: Traffic Pattern Zone
 - Allow residential uses
 - Allow most nonresidential uses; prohibit outdoor stadiums and similar uses with very high intensities
 - Avoid children's schools, large day care centers, hospitals, and nursing homes

(3) City of Long Beach

The City of Long Beach Health Department reviews plans for and inspects restaurants, hazardous waste generating facilities, and multi-family housing.

(a) Public Safety Element

The City of Long Beach Public Safety Element (1975) contains a recommendation that “above ground fuel storage facilities should not be located in close proximity to the flight pattern at the Long Beach Airport.”¹⁷¹

2. ENVIRONMENTAL IMPACTS

a. Methodology

This evaluation of hazards and hazardous materials is based on existing reports and data regarding existing and past facilities, operations, infrastructure, and environmental conditions within the project site. In particular, the Phase I report prepared by Tetra Tech includes a comprehensive summary of the site history and information pertaining to USTs and other related hazards (refer to Appendix L). In addition, the Environmental Assessment and Remediation Program Summary prepared by Haley & Aldrich, Inc. also documented historical use of the project site and summarizes current characterization and corrective efforts (refer to Appendix K). A Report on Potential Hazards Related to the Long Beach Airport Operations was prepared by Walter E. Gillfillan and Associates (refer to Appendix J) and is based on documents such as FAR Part 77, the ALUP, the City of Long Beach Noise Ordinance, data from the City of Long Beach, and guidelines within the Caltrans Handbook. Based on these sources and a review of existing and proposed uses on the project site, an evaluation was performed to identify hazards that could exist as a result of project implementation.

b. Thresholds of Significance

For purposes of this analysis, impacts associated with health and safety hazards and the use of hazardous materials would be considered significant if the project will:

(1) Hazardous Materials

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

¹⁷¹ *City of Long Beach Public Safety Element, 1975, Recommendation 37, page 132.*

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment; or

(2) Airport Safety

- Result in a safety hazard for people residing or working in the project area for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

c. Project Features

As part of implementation of the project, the Applicant will be required to comply with the various regulations described above, which pertain to the use, handling, storage, and transport of hazardous materials (e.g., removal of asbestos-containing materials and lead-based paint and underground storage tanks).

No buildings are proposed within the “Building Restriction Line” or RPZs designated by the Airport Layout Plan. Rather, on-site uses located within the RPZs and Building Restriction Lines are limited to open space and/or surface parking of automobiles, as shown in Figure 42 on page 362. In addition, due to the proximity of the Airport, maximum building heights above Mean Sea Level (MSL) for properties within the PacifiCenter have been established to comply with FAA requirements. As illustrated in the site sections provided in Figure 12 on page 131 of Section III, Project Description, the proposed PacifiCenter buildings, landscaping, and other vertical features have been designed to comply with these height restrictions. Furthermore, in accordance with FAA requirements, the Design Guidelines for the project will indicate that height is defined as the maximum height of any building element (e.g., parapets, spires, mechanical penthouses, stair enclosures, elevator overrides, antennas, and railings) for those height zones closest to the Airport.

Consistent with the policies within the County ALUP, the following project features are also incorporated into the proposed project:

- Above-ground storage of flammable liquids or toxic materials in a designated RPZ shall be avoided to the extent feasible. In the event that such storage would be necessary within a designated RPZ, the quantity shall be less than 100 gallons of flammable liquids or toxic materials on any one net acre;
- Uses that may direct a steady or flashing light of red, white, green, or amber colors toward aircraft engaged in takeoff or landing within a RPZ shall not be permitted;
- The erection or growth of objects that rise above an approach surface within the RPZ of Runway 16L and 16R shall be restricted, unless supported by evidence that it does not create a safety hazard as determined by the FAA;
- Any uses that would attract large concentrations of birds, emit smoke, or that may otherwise affect safe air navigation shall be avoided; and
- Uses that could generate electrical interference that may be detrimental to the operation of aircraft and/or aircraft instrumentation shall be avoided.

d. Analysis of Project Impacts

(1) Hazardous Materials

(a) Asbestos Containing Materials

As discussed in Section III, Project Description, buildings on the project site are being demolished as part of the ongoing remediation of these former industrial areas. Given the age of some of these buildings, building materials containing asbestos are assumed to be present in all buildings, and safe handling of such materials is required to prevent adverse impacts to the proposed PacifiCenter redevelopment program. In accordance with SCAQMD Rule 1403 and federal regulations applicable to asbestos demolition activities, pre-demolition building surveys must be performed to identifiable regulated asbestos-containing building materials (ACBM) and such materials must generally be removed prior to building demolition by certified asbestos containment contractors. Applicable legal requirements relating to ACBM removal and related building demolition activities also include advance notices to regulatory oversight agencies, extensive training for workers, and detailed requirements relating to the ongoing

containment, management and disposal of the ACBM.¹⁷² Compliance with these legal requirements for this ongoing ACBM abatement and related demolition work will continue to assure that Boeing employees elsewhere in the facility, and members of the public living or visiting nearby, will not be exposed to any airborne asbestos hazard.

(b) Lead-Based Paint

As with ACBM, lead-based paint was commonly used in older buildings. Exposure to lead at harmful levels can cause adverse health impacts. The ongoing demolition of buildings containing lead-based paints is subject to a comprehensive set of California regulatory requirements that are designed to assure the safe handling and disposal of these materials. Demolition workers are at greatest risk of adverse health exposures and are protected pursuant to requirements set forth in CCR Title 8, Section 1532.1 (described above), which provides for exposure limits, exposure monitoring, and respiratory protection and mandates good working practices by workers exposed to lead. As part of compliance with these requirements, Boeing requires bidding contractors to provide evidence of certified training for lead-related construction work. Lead-contaminated debris and other wastes must also be managed and disposed of in accordance with applicable provisions of the California Health and Safety Code. Compliance with these legal requirements for ongoing lead-based paint abatement and related demolition work will continue to assure that Boeing employees elsewhere in the facility, workers and occupants of the redeveloped PacificCenter project, and members of the public living or visiting nearby, will not be exposed to any hazards associated with lead-based paint debris and materials.

(c) Underground Storage Tanks

Both of the USTs that remain on site will be removed either prior to or in conjunction with the demolition work for the former industrial areas of the project site. These USTs as well as any previously unidentified USTs that may be encountered during the ACER program will be removed in accordance with applicable Federal, State, and local Long Beach Fire Department regulatory requirements discussed above. Therefore, no significant impacts associated with USTs will occur as a result of the project.

¹⁷² *The abatement of asbestos containing materials is not required unless it is creating an airborne hazard or is being disturbed in such a manner that it is emitting an airborne hazard as a result of the disturbance.*

(d) Handling, Storage, Transport and Disposal of Hazardous Materials

The continued use of the Boeing Enclave for aviation-related uses will continue to involve the storage, transportation, and use of hazardous materials, and the handling of related hazardous wastes such as paint sludge and filters, sealant tubes, primer cups and contaminated debris, toner and dry ink, batteries, oil and oil/water mixtures, and jet fuel. As a routine part of the ongoing industrial operations in the Boeing Enclave areas, use, storage and disposal of such hazardous materials will continue to be subject to various federal, state, and local requirements that will assure that all hazardous materials management activities are safe and protective of human health and safety, and the environment.

The ongoing remediation program at the former industrial areas of the facility, including demolition of structures and remediation of soils and groundwater contaminated by historic releases of hazardous materials, may also result in the management and disposal of demolition debris and contaminated media, and may also expose demolition, remediation, and other construction workers to potential hazards from such hazardous materials. In addition, construction workers may be exposed to potential hazards as infrastructure is replaced and new infrastructure to serve the redevelopment project is installed. Federal and state workplace protection standards apply to such activities to assure worker safety.

As part of the project, future commercial businesses that locate on the PacificCenter may use hazardous materials that are typically used by such businesses, and will be subject to ongoing federal, state, and local regulations to assure the safe management of such materials. Should the uses at any of the on-site businesses warrant, necessary hazardous materials permits, such permits will be obtained and renewed, as appropriate, by the business owner. In addition, should it be determined that hazardous waste will be generated by any of the businesses that will be located on the project site, a U.S. EPA Identification Number will be obtained.

The use of household hazardous materials will occur on the project site and will be limited to small quantities of everyday household cleaners, automotive products, and other materials that are typical of residential uses. The use of such materials will not create a hazard on or near the project site. Furthermore, household hazardous waste generated

on the project site will be properly disposed of through the regularly scheduled Household Hazardous Waste Collection Program administered by the County of Los Angeles.¹⁷³

Finally, as the PacifiCenter project is completed over time, new residents and employees at the PacifiCenter project may be located near new commercial activities that handle hazardous materials, near ongoing industrial activities within the Boeing Enclave, and near the remaining phases of the ongoing demolition and remediation activities in the former industrial areas of the project site that are slated for development as part of the project. The RMP will be developed by the Applicant to assure that such hazards are fully protective of the health and safety of new residents and employees at PacifiCenter. Furthermore, all hazardous waste may be generated on the project site will be managed in accordance with California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (CCR, Title 22, Division 4.5).

(e) Gas and Oil Wells

As discussed above and shown on Figure 38 and Figure 39 on pages 346 and 348, respectively, the closest oil field to the project is the Long Beach Airport Oil Field located approximately 0.2 mile southwest of the site and the nearest oil well is located over 0.3 mile southwest of the site. Due to this distance, the Long Beach Airport Oil Field and oil wells in the vicinity of the project will not pose a hazard to the project site. Also due to this distance, the potential for migration of methane from the Long Beach Airport Oil Field to the project site in quantities sufficient to present a potential hazard at the site is considered minimal. The results of methane gas sampling and analysis conducted at the project site confirm this conclusion. Furthermore, soil gas and groundwater samples taken from beneath the site have found concentrations of methane that are significantly below the Lower Explosive Level (LEL) and 20 percent of the LEL for methane and thus, do not pose a hazard associated with potential methane combustion. As such, the gas and oil wells adjacent to the project site do not present a significant impact to the project.

(f) Electromagnetic Fields

As discussed above, various sources of EMFs will be introduced at the site, including appliances, wiring of buildings, and electrical transmission lines, including transmission lines associated with a potential substation on-site. However, as discussed

¹⁷³ This program is held on a regular basis at Veterans Stadium, which is less than one mile from the project site.

above, in 1999 the National Institute of Environmental Health Sciences (NIEHS) and National Institutes of Health released the report prepared in response to the 1992 Federal Energy Policy Act. As indicated above, the report concludes that “there is weak evidence for possible health effects from ELF-EMF exposures, and until stronger evidence changes this opinion, inexpensive and safe reductions in exposure should be encouraged.”¹⁷⁴ An example provided in the report regarding the steps to be taken include that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards.¹⁷⁵ Therefore, while appliances, wiring of buildings, and electrical distribution lines could expose people to EMFs, the potential impact would be considered less than significant.

(g) Contaminated Soil and Groundwater

As described above, in coordination with LARWQCB, Boeing is implementing an ongoing comprehensive environmental assessment and remediation program to clean up historic chemical releases to soil and groundwater from former industrial activities on the project site. This remediation program is mandated by Order of the LARWQCB and must be completed independent of the ultimate redevelopment of the project site. Former industrial buildings and ancillary structures are being demolished and shallow soils are being remediated, where necessary, in project areas in accordance with the LARWQCB requirements.¹⁷⁶ This component of site remediation program is being completed in phases that have been identified in the ACER program approved as part of the ongoing remediation work required under the LARWQCB Order (refer to in Figure 40 on page 353). Based on the results of assessment and remediation activities conducted to date, the LARWQCB has approved closure of 12 of the EIAs. The LARWQCB is reviewing and confirming the completion of the ACER program in these and the remaining EIAs as the work progresses. LARWQCB verification of the completion of the required components of remediation work shall also be required, as described below, before the Applicant obtains permits to construct new buildings as part of the project.

¹⁷⁴ NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields, Prepared in Response to the 1992 Energy Policy Act (PL 102-486, Section 2118), 1999, page 38.

¹⁷⁵ *Ibid.*

¹⁷⁶ Twelve feet below grade is considered by Cal/EPA to be a reasonable maximum depth at which a residential receptor could be potentially exposed to impacted soil and groundwater by dermal (skin) contact. The depth is derived from the average maximum excavation depth to install a typical residential swimming pool. Contamination located below this depth is more typically remediated by in-situ clean up methods rather than by excavation.

It is anticipated that potential groundwater remediation efforts, including, for example, the extraction and treatment of groundwater that has been adversely impacted by historic chemical releases, will occur over a longer period of time due to the geologic and technical constraints associated with groundwater remediation programs. In situ remediation efforts for impacted soils below 12 feet, including, for example, soil vapor extraction, will likewise occur over a longer period of time due to similar constraints. This ongoing activity will necessitate the installation of subsurface and limited surface cleanup equipment and structures. This cleanup related equipment will not affect or be accessible to new residents or employees at PacifiCenter. As described below, the RMP shall also include measures to assure the ongoing protection of future residents and employees at PacifiCenter in relation to these longer-term remediation efforts.

(2) Airport Safety

As discussed above, development in close proximity to an airport must consider all relevant Federal, State, and local safety regulations with regard to potential airport safety hazards. The project's compliance such applicable regulations is discussed below. Also provided below is consideration of the Caltrans Handbook.

PacifiCenter has been designed in conformance with the FAA safety regulations as set forth in FAR Part 77, and also in accordance with Los Angeles County ALUP safety regulations as follows:

1. PacifiCenter buildings comply with FAA height and RPZ restrictions.

Height zones proposed as part of the project are presented in Figure 14 on page 135 in Section III, Project Description. As evidenced by the various site sections presented in Figure 12 on page 131 of Section III, Project Description, all of the buildings or structures built within the proposed height zones will comply with the height restrictions set forth in the Long Beach Airport Runway Approach Zones Standards for Determining Obstruction to Air Navigation as per FAR Part 77 , which is illustrated in Figure 43 on page 366.

2. PacifiCenter also complies with the ALUP safety policies.

As indicated by Figure 42 on page 362, the project adheres to the restrictions associated with the RPZ at the end of Runways 16L and 16R and provides for unobstructed passage of landing aircraft through the above airspace. Due to the critical nature of this area, no structure will be built within this zone. As such, the project will assist in implementing the ALUP safety policy regarding

RPZs. In addition, the following previously described project features will also implement the safety policies set forth in the ALUP: restriction of above-ground storage tanks of flammable liquids or toxic materials in RPZs; restriction of lighting within an RPZ; restriction of erection or growth of objects within Runways 16L, 16R, 12, and 25R's RPZ; restriction of uses that may affect safe air navigation; and avoidance of uses that will generate electrical interference.

As discussed above, Part 77 provides that Applicant's must submit a FAA Form 7460-1 to the Administrator. The FAA will not "approve" the proposed project. Rather, the FAA will provide a written "finding" to the applicant that the project is one of three options: (1) not a problem with respect to air navigation; (2) is an obstruction, but not a hazard to air navigation; or (3) is a hazard to air navigation. This finding is advisory to the applicant and to local zoning jurisdictions. In addition, the FAA will review the proposed project to be certain that it does not create: (i) electromagnetic interference with air navigation facilities; nor (ii) lighting effects; nor (iii) smoke that would interfere with aircraft in flight.

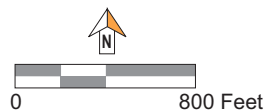
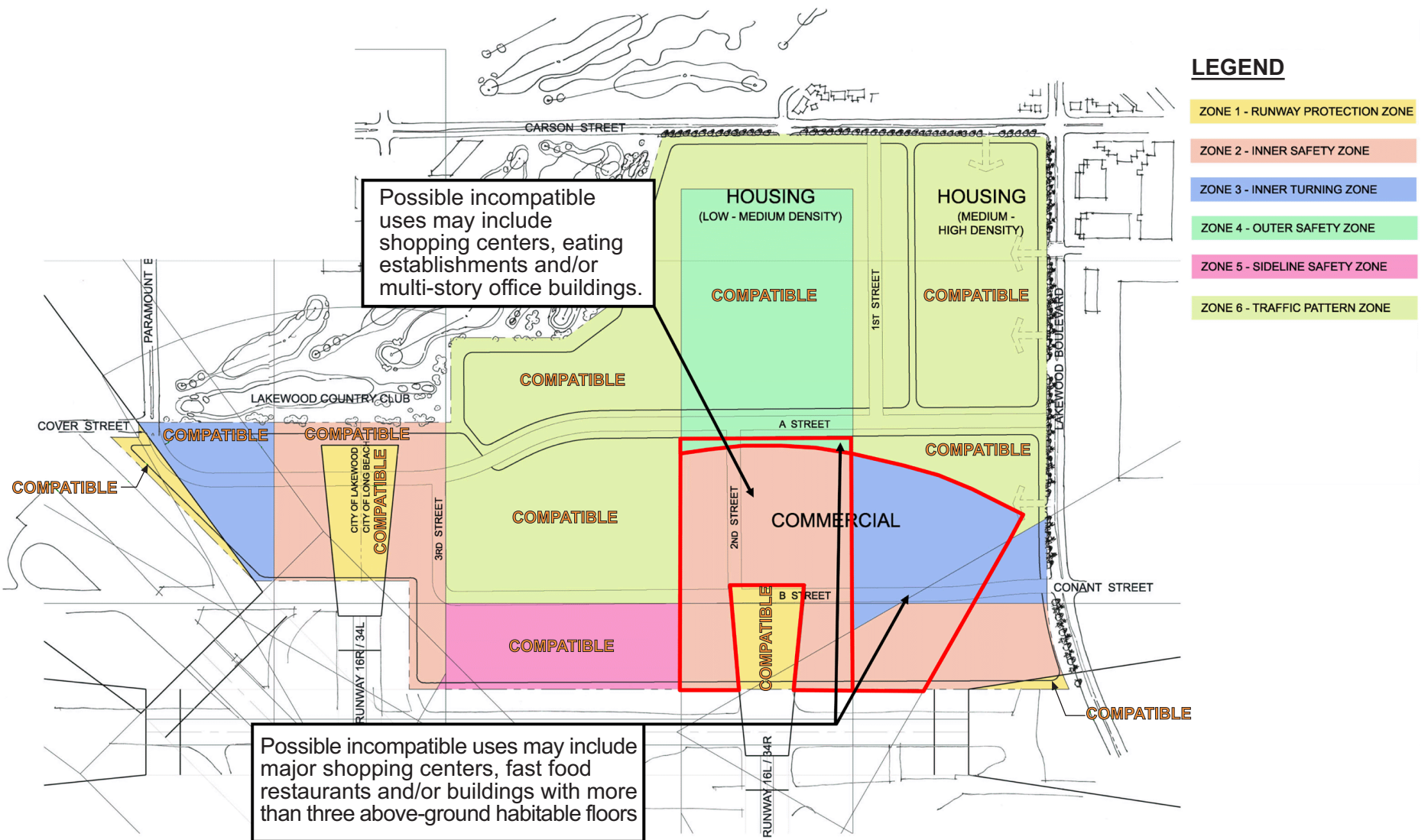
As discussed in the Report on Potential Hazards Related to the Long Beach Airport Operations presented in Appendix J, compliance with the provisions of Part 77 dealing with height or with interference factors does not guarantee absolute safety for aircraft in flight, but it does provide a uniform application of reasonable levels of risk exposure that are commensurate with other aspects of aviation activity. With respect to safety to persons on the ground, neither the FAA nor the County provides specific guidelines for land use compatibility beyond the RPZ. Thus, to evaluate potential safety impacts to persons on the ground, the Caltrans Handbook was used as the primary reference as it provides the most up-to-date, comprehensive source for compatibility assessment. As discussed above, the Caltrans Handbook guidance is based in part upon nation-wide data over a twenty-year period. The Caltrans guidelines serve as a "starting point" for a local determination process.

The Caltrans Handbook identifies factors that should be considered in land use determinations. Among these and others that are relevant to the Long Beach Airport are:

- Airports/runways with airline activity vs. those with general aviation activity;
- Runways used both day and night;
- Preferential runway usage;
- Aircraft operation levels;

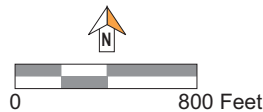
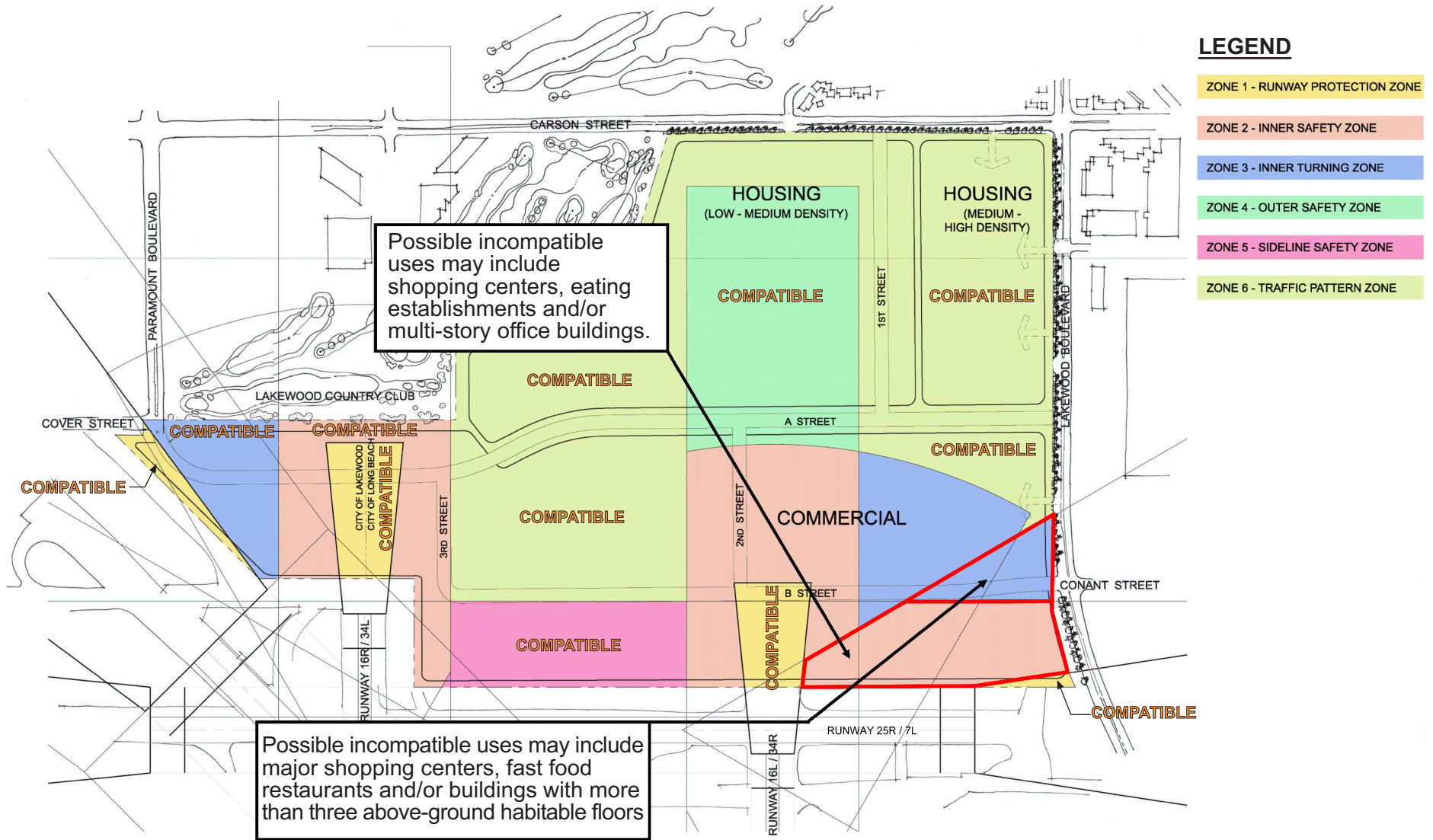
- Types of aircraft;
- Runway length/pavement strength;
- Left/right hand traffic patterns; traffic pattern size and altitude;
- Visual vs. instrument runways;
- Dispersion of air traffic on multiple runways by aircraft type; and
- Special usage such as training, helicopter operations, business jet centers, aircraft manufacturing.

As discussed in Appendix J, there are only two of the five runways (i.e., Runways 16L/34R and 25R/7L) at the Long Beach Airport where aircraft operations might impact the proposed project. Several of the Caltrans Handbook operating factors listed above that reduce the risk of exposure are exhibited within these runways. For instance, Runway 16L/34R is limited to smaller aircraft weighing less than 12,500 pounds; night operations are not permitted; Runway 16L is used infrequently for landings and Runway 34R is seldom used for takeoffs; 16L/34R is used for Visual Flight Rules only; and the traffic pattern altitude is 1,000 feet above ground level which allows a opportunity to reach the airport in the event of an engine failure. Runway 25R/7L also has a 1,000 foot traffic pattern altitude. All of the residential uses proposed as part of the PacifiCenter project would be compatible with the safety zone guidelines within the Caltrans Handbook, as discussed in detail in Appendix J. However, based on the guidelines within the Handbook, which are not specific to the Long Beach Airport, certain commercial areas of the PacifiCenter project would place possible incompatible uses in portions of some of the safety zones associated with Runway 16L/34R and Runway 25R/7L. Figure 44 on page 381 and Figure 45 on page 382 illustrate these areas. As shown in Figure 44, the proposed project may place possible incompatible uses, including shopping centers, eating establishments, and/or multi-story office buildings, in a portion of the Inner Safety Zone for Runway 16L/34R. In addition, the project may place possible incompatible uses, including major shopping centers, fast food restaurant, and/or buildings with more than three above-ground habitable floors, in a portion of the Inner Turning Zone near Lakewood Boulevard and Conant Street and within a narrow portion of the Outer Safety Zone immediately south of A Street west of First Street. With regard to Runway 25R/7L, as shown in Figure 45, based on the Caltrans Handbook Guidelines, the proposed project may place possible incompatible uses in the portion of the Inner Safety Zone of this runway in the southeast portion of the project site. In addition, the proposed project may place possible incompatible uses in a portion of the Inner Turning Zone within a small triangular area near the intersection of Lakewood Boulevard and Conant Street.



Source: Walter E. Gillfillan and Associates, 2003

Figure 44
Compatibility Associated with
Runway 16L/34R



Source: Walter E. Gillfillan and Associates, 2003

Figure 45
Compatibility Associated
with Runway 25R/7L

Aside from the areas identified above and shown in Figure 44 and Figure 45 on pages 381 and 382, all of the proposed uses on the project site, including residential, office, hotel, and retail, represent an acceptable form of development pursuant to the Caltrans Handbook guidelines. As discussed in Appendix J, when offering the human occupancy criteria, the Caltrans Handbook recognizes there can be variations in occupancy within the large zones. The Handbook provides for concentrations that may occur by allowing a doubling of the density in the Inner Safety Zone and the Inner Turning Zone for any 1-acre area. Similarly, an increase in overall density of 1.5 factor is provided when a "risk-reduction building design" is used. These two factors can be additive to a 3 times increase in any one acre. This provision in the Handbook criteria allows the specific siting of structures and activities within the PacifiCenter to limit the consequences of an accident, should one occur.

Based on the above, the proposed PacifiCenter project complies with all the relevant FAA and ALUP regulations. However, without mitigation measures, the proposed project may place possible incompatible uses in some of the safety zones identified as guidelines in the Caltrans Handbook. As discussed in Appendix J, when accounting for several factors including the current and future operations of the Airport, and with implementation of the mitigation measures provided below, the project will not result in a significant impact associated with the risk exposure to aircraft operations that will cause a safety hazard for people residing or working in the PacifiCenter project area. In addition, as indicated above, based on NTSB data, there are no known accidents that have occurred within the PacifiCenter site within the last twenty years.

(3) City of Long Beach

The project would result in an increase in plan check and inspection of restaurants, multi-family housing and hazardous waste generating facilities by the City of Long Beach Health Department staff. However, health services fees paid by a developer at the time of submittal of an application for plan check would be sufficient to fund the Health Department expenditures associated with staffing for project induced demand with regard to plan check and inspections. Therefore, no significant impact would occur with regard to Health Department resources.

The project would comply with the City of Long Beach Public Safety Element recommendation regarding above ground fuel storage facilities within close proximity to the flight pattern at the Long Beach Airport through the incorporation of the project features regarding such storage. As indicated above, above ground storage of flammable liquids or toxic materials in a designated RPZ shall be avoided to the extent feasible. In the event that such storage would be necessary within a designated RPZ, the quantity shall be less

than 100 gallons of flammable liquids or toxic materials on any one net acre in accordance with FAA regulations.

(4) Conclusions

Based on the above, during construction and operation of the PacifiCenter project, hazardous materials will be used, handled, stored, and disposed of in accordance with applicable government regulations and standards. Therefore, the project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Although the site is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (as a site that is subject to a CAO by the LARWQCB), it will not create a significant health hazard because, soil and groundwater contamination at the site are being remediated in compliance with the CAO and will remain subject to the ongoing oversight of the LARWQCB. In addition, with the implementation of the previously described project features and the mitigation measures provided below, construction and operation of the PacifiCenter project will not result in the exposure of people to existing and proposed sources of potential health and safety hazards. Finally, with implementation of mitigation measures, the project will not result in a safety hazard for people residing or working in the project area for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

3. CUMULATIVE IMPACTS

As indicated above, the project area is the site of the former Boeing C-1 facility and contains areas of contaminated soil and groundwater. As a separate program pursuant to an order issued by LARWQCB, Boeing is implementing a comprehensive environmental assessment and remediation program for the project site (Related Project No. 44), which includes the dismantling and demolition of some and potentially all of the site's buildings and facilities, as well as the remediation of soil and groundwater. These efforts are being coordinated with LARWQCB in compliance with applicable regulations and will occur regardless of whether the PacifiCenter project goes forward. The demolition and remediation activities will improve the conditions of the area surrounding the project site with respect to hazards and hazardous materials.

There are several existing and former industrial and institutional facilities within one mile of the project site that could also have potentially impacted the site in the past. For a description thereof, refer to the Phase I Report included as Appendix L of this EIR. Most of the facilities that pose a potential threat are listed in the applicable databases as leaking UST sites. Two service stations have posed a potential impact on the site: a TOSCO service station and a Standard Oil Service Station, both located on Lakewood Boulevard. The TOSCO service station no longer exists and the property has been acquired by the City of Long Beach. The property, which is located at the corner of Lakewood Boulevard and Carson Street is being remediated by the previous property owner, who remains responsible for such remediation. Disposition of this property to Boeing Realty Corporation or other development entity may be completed as part of the project. As with other remediation efforts, any contamination will be remediated to levels that present no significant human health risk for future uses, in accordance with the appropriate regulatory agency. Records relating to the second site show that eight USTs have been removed from the site, with no indication of soil or groundwater contamination, and the Long Beach Fire Department granted closure of the site. There are also several other sites in the area that have had chemical releases that have impacted the groundwater and could have impacted the PacifiCenter site. To the extent that these off-site properties could have impacted the PacifiCenter site, the separate and ongoing on-site remediation program is designed to address and remedy these off-site sources of potential hazards or hazardous materials.

The remediation program is the only ongoing or future planned significant remediation project in the immediate vicinity of the project site that will involve the handling of significant quantities of hazardous wastes and materials. Regardless, any future development in the vicinity, including nearby related projects (Related Project Nos. 6, 12, 77, 82, 85, 86, etc.), will also be subject to a wide range of Federal, State, and local regulations pertaining to hazards and hazardous materials, which will assure that there will be no adverse impacts from such projects to the PacifiCenter site.

Moreover, development of the PacifiCenter project, including implementation of the project features and mitigation measures proposed as part of the project, will not add incrementally to a cumulative impact relative to hazards and hazardous materials. The ongoing remediation program required by the CAO will result in a substantial net benefit to soil and groundwater quality, and the RMP (discussed below) will further ensure the health and safety of the site's future residents and employees during the phased redevelopment and remediation of the site. As such, cumulatively significant impacts associated with hazards and hazardous materials will not result from implementation of the project.

As it relates to airport safety issues, the proposed Airport improvements (Related Project No. 77), which involve 43,000 square feet of building improvements, and a 4,000-space parking garage, can be reasonably expected to provide the same level of safety as exists currently in accordance with FAA safety regulations, the Los Angeles County ALUP, and Caltrans Handbook guidance. As discussed above, PacifiCenter has been designed in conformance with relevant FAA and ALUP regulations. Additionally, as discussed in Appendix J, when accounting for current and future operations at the Airport (which is projected to accommodate projected growth to 3.8 million annual passengers based on the September 2003 Notice of Preparation regarding the Long Beach Airport Terminal Area Improvements), and with implementation of the project mitigation measures provided below, a significant impact associated with the risk of exposure to aircraft operations causing a safety hazard for people residing or working in the PacifiCenter project area will not occur. Cumulative safety impacts will be less than significant.

4. MITIGATION MEASURES

Completion of the ongoing remediation (including demolition) work required under the LARWQCB Order will assure the protection of human health and safety and the environment in relation to soil and groundwater that was historically impacted by primary compounds/constituents.

As part of the project, prior to the construction of new buildings at the site, the Applicant shall also develop and implement a Risk Management Plan (RMP) to assure that the phased completion of ongoing remediation work and the phased completion of proposed redevelopment will continue to be fully protective of human health and safety, and the environment. The mitigation measures in this section set forth the required contents of the RMP. With implementation of this RMP program, project impacts related to soil and groundwater conditions will be reduced to a less-than-significant level.

- V.E-1 Prior to constructing new buildings in an Environmental Investigation Area (EIA), obtain LARWQCB confirmation that the required demolition and soil remediation work has been completed as required by the ACER program, and that the EIA is suitable for redevelopment (LARWQCB Completion Notice).

Monitoring Phase: Pre-Construction

Enforcement Agency: Regional Water Quality Control Board

Monitoring Agency: Regional Water Quality Control Board

Action Indicating Compliance: Confirmation provided with Approval of Plans

V.E.-2 Complete a Risk Management Plan (RMP), to remain in place and effective during the construction of new buildings and after project development, until the site has been remediated as required by the CAO, that includes the following:

- Develop and record all required environmental disclosures, covenants and restrictions relating to historical impacts to soil and groundwater, including residual conditions or restrictions that may remain in place in some areas during or after full implementation of the LARWQCB Order.
- Develop and implement a consolidated Health and Safety Plan (HSP) for redevelopment construction workers that includes all required elements to assure worker protection in relation to soil and groundwater conditions on the project site. Provide the RMP, including this HSP, to construction contractors and sub-contractors and require compliance with the HSP in all construction contracts that include work scopes likely to require contact with subsurface soils or groundwater.
- On EIAs for which there has been no LARWQCB Completion Notice as of the commencement of redevelopment construction activities, limit access with adequate fencing or other barriers to protect new residents and employees at PacifiCenter. Identify and implement risk management measures within EIAs that are adjacent to or may otherwise affect completed redevelopment areas, including a routine inspection program to assure that such measures are being implemented.
- On EIAs for which groundwater or deeper-soil remediation work is planned or ongoing as of the commencement of constructing new buildings, identify and implement risk management measures for the management of impacted soils and groundwater, and for the installation and operation of remediation equipment and processes, that are fully protective of the health and safety of the public and PacifiCenter residents and employees, including a routine inspection program to assure that such measures are being implemented. At

minimum, such measures shall include compliance with all applicable federal, state and local laws and regulations.

- Identify and implement risk management measures for managing demolition debris, including debris containing asbestos materials or lead-based paints, to assure are fully protective of the health and safety of the public and PacifiCenter residents and employees, including a routine inspection program to assure that such measures are being implemented. At minimum, such measures shall include compliance with all applicable federal, state and local laws and regulations.
- Identify and implement accident prevention and control measures for demolition and remediation activities, and for ongoing operations within the Boeing Enclave, that are protective of the health and safety of the public and PacifiCenter residents and employees, including a routine inspection program to assure that such measures are being implemented. At minimum, such measures shall include compliance with all applicable federal, state and local laws and regulations.
- Identify and implement standards for imported soils and compaction materials to assure that such fill materials are fully protective of human health and the environment, and require contractors responsible for imported fill to meet these standards.
- Identify and implement project design features that may be used to minimize impacts to ongoing or planned remediation work in project area groundwater or soils, including, for example: (a) landscaping features that will not require excessive quantities of water thereby avoiding interference with groundwater areas requiring remediation; (b) building features that may minimize the potential for migration of soil vapors into occupied indoor areas; and (c) land plan elements that are consistent with planned longer-term remediation efforts.

Monitoring Phase: Pre-Construction

Enforcement Agency: Regional Water Quality Control Board

Monitoring Agency: Regional Water Quality Control Board

Action Indicating Compliance: Approval of Plans

In addition to the project features presented and evaluated in this section, the following mitigation measures are recommended to reduced project impacts relative to hazards to less-than-significant levels:

- V.E-3 In accordance with FAA requirements, prior to commencement of construction of any building, the construction sponsor shall file Form 7460-1, Notice of Proposed Construction or Alteration, with the appropriate regional FAA office for airspace review.

Monitoring Phase: Pre-Construction

Enforcement Agency: Federal Aviation Administration

Monitoring Agency: City of Long Beach Department of Planning and Building and City of Lakewood Department of Community Development

Action Indicating Compliance: Issuance of building permits

- V.E-4 Prior to execution of a “through-the-fence” agreement for a proposed aviation-related use, the proposal shall be submitted to the Airport for review and approval and the Airport will consult with the FAA.

Monitoring Phase: Pre-Construction

Enforcement Agency: Long Beach Airport

Monitoring Agency: City of Long Beach Department of Planning and Building and City of Lakewood Department of Community Development

Action Indicating Compliance: Approval of a “through-the-fence” Agreement”

- V.E-5 No building(s) shall be constructed in the Runway Protection Zones (RPZs) designated by the Airport Layout Plan.

Monitoring Phase: Pre-Construction

Enforcement Agency: Airport Land Use Commission

Monitoring Agency: City of Long Beach Department of Planning and Building and City of Lakewood Department of Community Development

Action Indicating Compliance: Approval of Plans

V.E-6 The following measures shall be implemented to reduce the risk of exposure to airport-related hazards associated with aircraft operations on Runway 16L/34R:

- Provide street alignment and landscaping along the extended runway centerline;
- Locate automobile parking, in the commercial areas, adjacent to the extended runway centerline so as to reduce the building coverage in that area;
- Utilize construction that would limit small aircraft penetration in the Inner Safety Zone and Inner Turning Zones;
- Avoid concentrations of people near extended runway centerline and runway end by locating elements such as streets, setbacks, parking, and landscaping, near extended runway centerline and runway end;
- Avoid concentrations of people that are not shielded by structure from aircraft penetration in the Inner Safety and Inner Turning zones by locating primarily buildings within the Inner Safety and Inner Turning zones rather than developing areas where people would congregate (i.e., amphitheaters, band stands); and
- Comply with the Federal Aviation Regulations, Part 77 height limits.

Monitoring Phase: Pre-Construction

Enforcement Agency: City of Long Beach Department of Planning and Building

Monitoring Agency: City of Long Beach Department of Planning and Building

Action Indicating Compliance: Approval of Plans

V.E-7 The following measures shall be implemented to reduce the risk of exposure to airport-related hazards associated with aircraft operations on Runway 25R/7L:

- Provide street alignment and automobile parking to reduce land coverage in areas nearest the runway operating areas;

- Utilize construction that would limit small aircraft penetration in the Inner Safety Zone and Inner Turning Zone;
- Avoid concentrations of people that are not shielded by structure from aircraft penetration in the Inner Safety Zone and Inner Turning Zones, by locating primarily buildings within the Inner Safety and Inner Turning zones rather than developing areas where people would congregate (i.e., amphitheaters, band stands); and
- Comply with the Federal Aviation Regulations, Part 77 height limits.

Monitoring Phase: Pre-Construction

Enforcement Agency: City of Long Beach Department of Planning and Building

Monitoring Agency: City of Long Beach Department of Planning and Building

Action Indicating Compliance: Approval of Plans

5. SIGNIFICANCE AFTER MITIGATION

With implementation of the project features and the recommended mitigation measures, impacts relative to hazards and hazardous materials will be less than significant.